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Subfamily Phyllostominae Gray, 1825 from Mammals of South America

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The subfamily Phyllostominae is distributed from the southern United States (Arizona, California, and southern Nevada), southward into northern Argentina, Paraguay, and southern Brazil. South American phyllostomines are primarily restricted to the mainland, but also occur on a few major islands off the coast of South America, such as Margarita Island (Venezuela), Trinidad and Tobago, and the Netherlands Antilles, as well as the Greater and Lesser Antilles.

The number of genera and species recognized in the subfamily depends on the taxonomic interpretations of the content of the genera *Lophostoma*, *Micronycteris*, *Mimon*, *Phyllostomus*, and *Tonatia*. In near agreement with the interpretation by Simmons and Voss (1998), plus a few subsequent additions, we here recognize 16 genera and 42 species. Fifteen genera and 41 species occur in South America, where 12 species are endemic. The following nine genera are considered to be monotypic: *Chrotopterus*, *Lampronycteris*, *Macrophyllum*, *Neonycteris*, *Phylloderma*, *Trachops*, *Trinycteris*, and *Vampyrum*. In contrast, *Lophostoma* contains at least seven species and *Micronycteris* contains at least eight.

Most publications providing useful information about the subfamily Phyllostominae are restricted to specific taxa or to geographical areas. Other references, such as Goodwin and Greenhall (1961), Husson (1962, 1978), Hall (1981), and Koopman (1993, 1994) either are or contain good general references to the subfamily. Specific but dated information is available in "Biology of bats of the New World family Phyllostomatidae" (R. J. Baker, Jones, and Carter 1976, 1977, 1979) and in "Mammalian biology in South America" (Mares and Genoways 1982). A number of competing classifications attempting to arrange taxa phylogenetically within the Phyllostominae have appeared in recent years (e.g., R. J. Baker, Hood, and Honeycutt 1989; Van Den Bussche 1992; Koopman 1993; R. J. Baker et al. 2000; Wetterer, Rockman, and Simmons 2000; K. E. Jones et al. 2002; R. J. Baker et al. 2003). These highlight the strong research interest in the phyllostomids; however, we have not segregated the genera of the Phyllostominae according to the phylogenies suggested in these publications.

In preparing this review, we examined specimens from the National Museum of Natural History; American Museum of Natural History; Field Museum; Museum of Comparative Zoology, Harvard University; Royal Ontario Museum; and Carnegie Museum of Natural History. We extend our appreciation to the individuals at these institutions who provided assistance, particularly K. F. Koopman, R. D. Fisher, R. M. Timm, J. L. Eger, R. L. Honeycutt; T. A. Hiener, M. A. Schmidt, and K. D. Williams typed the manuscript; A. L. Gardner provided information for the synonymies; K. D. Williams assisted with the final preparation of the manuscript.

The subfamily Phyllostominae is characterized by a well-defined noseleaf and a molar configuration in which the cusps and commissures maintain a W-pattern (Miller 1907b: 118, 122–23). The interfemoral membrane is usually well developed. The tail may differ among taxa, from total absence, to being long and extending to the margin of the interfemoral membrane.

KEY TO SOUTH AMERICAN GENERA OF PHYLLOSTOMINAE:

1. One pair of lower incisors 2
1′. Two pairs of lower incisors 5
2. Tail rudimentary, not readily visible; forearm more than 70 mm; three lower premolars; greatest length of skull more than 35 mm . . . . . *Chrotopterus*
2′. Tail well developed; forearm less than 70 mm; greatest length of skull less than 35 mm 3
3. Two lower premolars . . . . . *Mimon*
3′. Three lower premolars 4
4. Postorbital constriction less than 5 mm . . . *Lophostoma*
4′. Postorbital constriction more than 5 mm . . . . . *Tonatia*
5. Tail enclosed in, and extending to posterior margin, of interfemoral membrane 6
5′. Tail enclosed in interfemoral membrane, but not extending to posterior margin 7
6. Length of noseleaf more than three times its width; forearm more than 40 mm; rostrum elongated with a distinct concavity in interorbital region . . . . . *Lonchorhina*
6′. Length of noseleaf less than three times its width; forearm less than 40 mm; rostrum not elongated and lacks a distinct concavity in interorbital region . . . . . *Macrophyllum*
7. Two lower premolars . . . . . *Phyllostomus*

7′. Three lower premolars 8
8. Forearm longer than 100 mm; tail absent; rostrum as long as braincase . . . . . *Vampyrum*
8′. Forearm shorter than 75 mm; tail present; rostrum shorter than braincase 9
9. Conspicuous, papilla-like protuberances on lips and chin; margin of noseleaf finely serrated; forearm 55–65 mm . . . . . *Trachops*
9′. Lips and chin without papilla-like protuberances; margin of noseleaf lacking fine serrations 10
10. Forearm 65–74 mm; tips of wings whitish; greatest length of skull 30–33 mm . . . . . *Phylloderma*
10′. Forearm 33–58 mm; greatest length of skull 17–28 mm 11
11. First upper incisors similar to canines in length; first upper premolar (P3) having accessory cusps on lingual and posterior margins . . . . . *Glyphonycteris*
11′. First upper incisors distinctly shorter and narrower than canines; first upper premolar (P3) lacking accessory cusps, only the main cusp present 12
12. Forearm longer than 35 mm; greatest length of skull more than 20 mm 13
12′. Forearm shorter than 35 mm; greatest length of skull less than 20 mm . . . . . *Neonycteris*
13. Length of ear (from notch) less than 16 mm; calcar about the same length as foot; upper incisors chisel-shaped and in line with canines . . . . . *Lampronycteris*
13′. Length of ear (from notch) more than 16 mm; calcar shorter than foot; faint gray medial stripe often present on lower back; upper incisors not chisel-shaped; upper incisors projected forward and not in line with canines . . . . . *Trinycteris*

Genus *Chrotopterus* W. Peters, 1865

The monotypic genus *Chrotopterus* is represented by *Chrotopterus auritus*, one of the larger bats in South America (forearm 74–83 mm, greatest length of skull 34–37 mm). The genus is characterized by relatively long, woolly pelage; a rudimentary tail (may appear absent); a calcar that is longer than the foot; and a lower tooth row that has three premolars and one incisor. The dental formula is 2/1, 1/1, 2/3, 3/3 × 2 = 32 (also in *Tonatia* and *Lophostoma*).

SYNONYMS:

Vampyrus: W. Peters, 1856a:305; not *Vampyrus* Leach, 1821b:79.

Chrotopterus W. Peters, 1865c:505; type species *Vampyrus auritus* W. Peters, 1856a, by original designation; described as a subgenus of *Vampyrus* Leach, 1821b.

Chrotoptems Dobson, 1878:471; in synonymy; incorrect subsequent spelling of *Chrotopterus* W. Peters.

Chrotoperus R. J. Baker, R. M. Fonseca, D. A. Parish, C. J. Phillips, and F. G. Hoffmann, 2004:4; incorrect subsequent spelling of *Chrotopterus* W. Peters.

Chrotopterus auritus (W. Peters, 1856)

Great Woolly Bat

SYNONYMS:

Vampyrus auritus W. Peters, 1856a:305, type localities "Mexico et Guiana"; restricted to Mexico by W. Peters (1856b:415).

[*Vampyrus (*]*Chrotopterus*[*)*] *auritus*: W. Peters, 1865c: 505; name combination.

Chrotopterus auritus: Hensel, 1872:20; first use of current name combination.

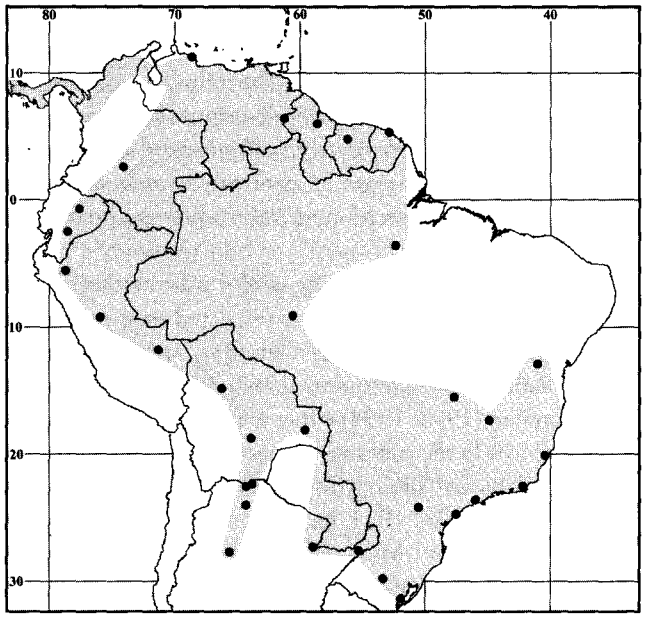
[*Vampyrus (Vampyrus)*] *auritus*: Trouessart, 1897:153; name combination.

Chrotopterus auritus guianae O. Thomas, 1905b:308; type locality "La Vuelta, Lower Orinoco," Bolívar, Venezuela.

Chrotopterus auritus australis O. Thomas, 1905b:308; type locality "Concepcion," Concepción, Paraguay.

DISTRIBUTION: *Chrotopterus auritus* is known from Colombia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Ecuador, Peru, Bolivia, Paraguay, and northern Argentina. The species also occurs in Central America and southern Mexico.

MARGINAL LOCALITIES (Map 131): VENEZUELA (Handley 1976): Falcón, 12 km ENE of Mirimire; Bolívar, El Manaco, 56 km SE of El Dorado. GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Sipaliwini, Raleigh Falls (S. L. Williams



Map 131 Marginal localities for *Chrotopterus auritus* •

and Genoways 1980a). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL: Pará, Rio Xingu, 52 km SW of Altamira (Voss and Emmons 1996); Mato Grosso, Aripuanã (Mok, Luizão, and Silva 1982); Distrito Federal, Gruta Dança dos Vampiros (Bredt, Uieda, and Magalhães 1999); Minas Gerais, Pirapora (C. O. C. Vieira 1955); Bahia, Caverna Poço Encantado (Gregorin and Mendes 1999); Espírito Santo, Santa Leopoldina (Taddei 1975); Rio de Janeiro, Poço das Antas Biological Reserve (Baptista and Mello 2001);São Paulo, Biritiba Mirim (McNab 1969); São Paulo, Iguapé (C. O. C. Vieira 1955); Paraná, Fazenda Monte Alegre (N. R. Reis, Peracchi, and Sekiama 1999); Rio Grande do Sul, São Lourenço (C. O. C. Vieira 1955); Rio Grande do Sul, Restinga Seca (Fabián, Rui, and Oliveira 1999). ARGENTINA: Misiones, Leandro N. Alem (Barquez, Mares, and Braun 1999); Chaco, Colonia Benitez (Cabrera 1938). BOLIVIA: Santa Cruz, Río Tucavaca, 24 km by road N of Santiago de Chiquitos (S. Anderson 1997). ARGENTINA: Salta, 6 km W of Piquirenda Viejo (Barquez, Mares, and Braun 1999); Jujuy, Palma Sola (Barquez and Ojeda 1992); Tucumán, Dique San Ignacio, La Cocha (Barquez, Mares, and Braun 1999); Salta, Vado de Arrazayal (Barquez 1984a). BOLIVIA: Santa Cruz, 14.5 km by road NW of Masicuri (S. Anderson 1997); Beni, Río Matos (S. Anderson 1997). PERU: Madre de Dios, Cocha Cashu (Terborgh, Fitzpatrick, and Emmons 1984); Cusco, Cashiriari-2 (S. Solari et al. 2001c); Huánuco, vicinity of Tingo María (Bowles, Cope, and Cope 1979); Cajamarca, Bellavista (MCZ 17060). ECUADOR (Albuja and Mena 1991): Azuay, San José Grande; Napo, Huamaní. COLOMBIA: Meta, Cabaña Duda (Lemke et al. 1982).

SUBSPECIES: We treat *C. auritus* as monotypic pending revision of the species (see Remarks).

NATURAL HISTORY: *Chrotopterus auritus* is associated with forested habitats (Hill 1965; Handley 1966c, 1976; S. L. Williams and Genoways 1980a). This species roosts in caves (W. B. Davis, Carter, and Pine 1964; Handley 1976; Bowles, Cope, and Cope 1979), hollow termite nests (Sanborn 1932b), and hollow trees (Medellín 1988, 1989). Although *C. auritus* is considered to be carnivorous, because of reports of its eating small vertebrates (Tuttle 1967; Villa-R. and Villa-Cornejo 1969; Gardner 1977c; I. Sazima 1978), insects and fruit are also included as part of the diet (Gardner 1977c). Medellín (1988) found the remains of insects (Cerambycidae, Scarabeidae, and Sphingidae), birds (3 species identified and 11 unidentified), and mammals (shrews and five species of identified rodents plus several unidentified) dropped under a tree roost of *C. auritus* in the state of Chiapas, Mexico. Delpietro, Contreras, and Konolaisen (1992) commented on foraging in groups and behavior they interpreted as mobbing when a group of *C. auritus* milled around a group member as it vocalized after being caught in a mistnet. Webb and Loomis (1977) listed a mite, a tick, and one nycteribiid and two streblid batflies reported from *C. auritus*. R. Guerrero (1985a) added two streblid batflies, and later (1997) listed five species of which one had not been reported earlier. Graciolli and Carvalho (2001) listed the nycteribiid batfly *Basilia ortizi* as known from Brazilian *C. auritus*. Medellín (1989) reviewed this species in his *Mammalian Species* account and provided measurements, illustrations, and a synopsis of natural history information. The karyotype is $2n = 28$, FN = 52 (R. J. Baker et al. 1982; Moreille-Versute, Taddei, and Varella-Garcia 1992).

REMARKS: Handley (1966c), Myers and Wetzel (1983), Koopman (1994), and Simmons and Voss (1998) questioned the validity of the recognized subspecies. However, other recent authors (Hill 1965; Taddei 1975; J. K. Jones and Carter 1976; S. L. Williams and Genoways 1980a; Lemke et al. 1982) continued to recognize subspecies. Simmons and Voss (1998) found, represented in their small sample of five from Paracou, French Guiana, the pelage and color-pattern characters that O. Thomas (1905b) used to distinguish *australis* and *guianae* from each other, and from *auritus*. A thorough study of geographic variation in this species is needed.

Dilford C. Carter and Dolan (1978:37) claimed that the type locality of *Vampyrus auritus* was Santa Catarina, Brazil, and not Mexico as had been presumed. However, W. Peters (1856b:415) definitely stated that the specimen came from Mexico. Earlier, W. Peters (1856a:310) indicated that he had two specimens. The first, a male from Mexico collected by Deppe, and the other collected by Schomburgk in British Guiana. According to A. L. Gardner (pers. comm.), the lectotype of *Vampyrus auritus* W. Peters is ZMB 10058, and consists of a cleaned skull and skeleton with parts of the body still in alcohol. The specimen, originally catalogued as An. 18795/18796 in the anatomical collection, was part of Deppe's sixth shipment (inventory dated 21 Oct. 1825), which consisted of specimens collected in Oaxaca and Veracruz, Mexico. The exact source of the holotype is unknown.

Chrotopterus colombianus H. E. Anthony, 1920:84, is a junior synonym of *Lophostoma silvicolum*. According to K. F. Koopman (pers. comm.) the erroneous generic assignment for this taxon was the result of confusion concerning the number of lower premolars in *Chrotopterus*, perhaps caused by the error in Miller's (1907b:122) key to the genera, indicating that *Chrotopterus* had only two lower premolars. Measurements for *C. auritus* have been provided by Taddei (1975), Bowles, Cope, and Cope (1979), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), Hall (1981), Lemke et al. (1982), Myers and Wetzel (1983), and Simmons and Voss (1998).

Genus *Glyphonycteris* O. Thomas, 1896

There are three species recognized in *Glyphonycteris*, varying in size from *G. sylvestris* (forearm 38–44 mm) to *G. daviesi* (forearm 53–58 mm). The genus is characterized by the lack of a cutaneous band across the forehead connecting the ears; a domed braincase; caniniform upper inner incisors; short upper canines that are only a little longer than the incisors; a distinct lingual cingulum on the upper premolars; slightly recurved cusps on P4; and trifid lower incisors. The fourth metacarpal is the shortest and the fifth is longest. The dental formula is 1–2/3, 1/1, 2/3, 3/3 × 2 = 34–36.

SYNONYMS:

Glyphonycteris O. Thomas, 1896b:301; type species *Glyphonycteris sylvestris* O. Thomas, 1896b, by monotypy.

Micronycteris (Glyphonycteris): Sanborn, 1949a:233; name combination.

Barticonycteris Hill, 1965:556; type species *Barticonycteris daviesi* Hill, 1965, by original designation.

REMARKS: As revised by Andersen (1906a), *Glyphonycteris* also included *Schizostoma brachyote* Dobson, 1879 (= *Lampronycteris brachyotis*). Simmons and Voss (1998) compared and contrasted the several taxa traditionally treated as subgenera in *Micronycteris* and explained their reasons for assigning full generic rank to *Glyphonycteris* and for recognizing a more restricted assemblage of species in *Micronycteris*.

KEY TO THE SPECIES OF *GLYPHONYCTERIS*:

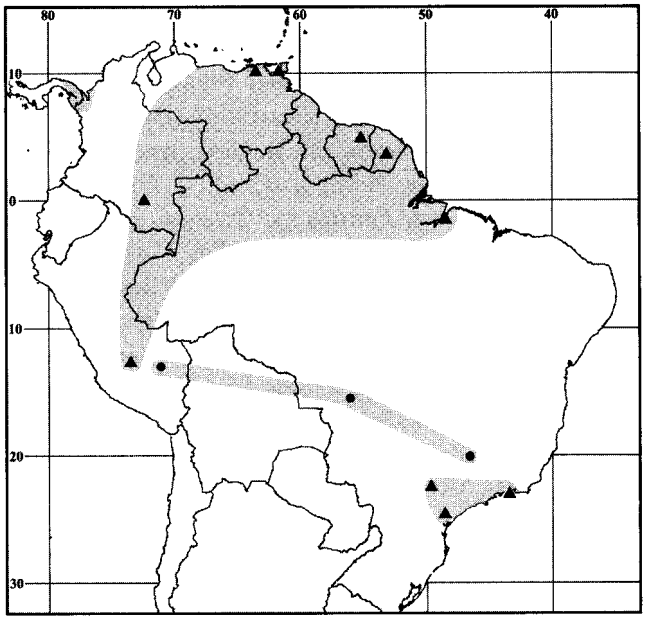
1. Forearm longer than 50 mm; dorsal hair brownish throughout; greatest length of skull more than 25 mm; one pair of upper incisors; crowns of lower incisors anteriorly-posteriorly long and transversely narrow . . . . . *Glyphonycteris daviesi*
1′. Forearm shorter than 50 mm; dorsal hair tricolored; greatest length of skull less than 25 mm; two pairs of upper incisors, outer incisor hidden by cingulum of canine; lower incisors normal 2
2. Forearm shorter than 44 mm; greatest length of skull less than 22 mm. . . . . *Glyphonycteris sylvestris*
2′. Forearm longer than 44 mm; greatest length of skull more than 21 mm . . . . . *Glyphonycteris behnii*

Glyphonycteris behnii (W. Peters, 1865)
Behn's Graybeard Bat

SYNONYMS:

Schizostoma Behnii W. Peters, 1865c:505; type locality "Cuyaba" (= Cuiabá), Mato Grosso, Brazil.

M[icronycteris]. behnii: Miller, 1898:330; name combination.



Map 132 Marginal localities for *Glyphonycteris behnii* ● and *Glyphonycteris sylvestris* ▲

Micronycteris (Glyphonycteris) behni: Sanborn, 1949a: 231; name combination and incorrect subsequent spelling of *Schizostoma behnii* W. Peters.

[*Glyphonycteris*] *behnii*: Simmons and Voss, 1998:61; first use of current name combination.

DISTRIBUTION: *Glyphonycteris behnii* is known from Brazil and eastern Peru.

MARGINAL LOCALITIES (Map 132): PERU: Cusco, Río Cosñipata (Andersen 1906a). BRAZIL: Mato Grosso, Cuiabá (type locality of *Schizostoma behnii* W. Peters); Minas Gerais, Serra da Canastra (Peracchi and Albuquerque 1985).

SUBSPECIES: We regard *G. behnii* as monotypic.

NATURAL HISTORY: *Glyphonycteris behnii* is the type host for the dichrocoeliid trematode *Parametadelphis compactus* Travassos, 1955; however, we suspect that the host (from Cachimbo, Pará, Brazil) is a misidentified *G. sylvestris*. As determined by the diet of its congeners, *G. behnii* likely consumes a variety of insects and small fruits. Additional information on natural history is unavailable.

REMARKS: *Glyphonycteris behnii*, along with *G. sylvestris* and *G. daviesi*, constitutes a group previously included in *Micronycteris (Glyphonycteris)*. This rare bat is known from four specimens, two from Brazil and two from Peru. The Peruvian locality was cited as located in departamento Puno by Andersen (1906a) and Tuttle (1970), but Koopman (1978) correctly placed Río Cosñipata in departamento Cusco. Simmons and Voss (1998:61) commented on examining several specimens in museums labeled "*Micronycteris behnii*" that proved on examination to be

either *G. sylvestris* or some other taxon. They suggested that *G. behnii* could prove to be a senior synonym of *G. sylvestris*. Measurements of *G. behnii* can be found in Andersen (1906a) and in Swanepoel and Genoways (1979). D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Schizostoma Behnii* W. Peters.

Glyphonycteris daviesi (Hill, 1965)
Davies's Graybeard Bat

SYNONYMS:

Barticonycteris daviesi Hill, 1965:557; type locality "Forest reserve 24 miles from Bartica, along the Potaro Road" (= 38.4 km S of Bartica), Cuyuni-Mazaruni, Guyana.

Glyphonycteris daviesi: Handley, 1976:2; first use of current name combination.

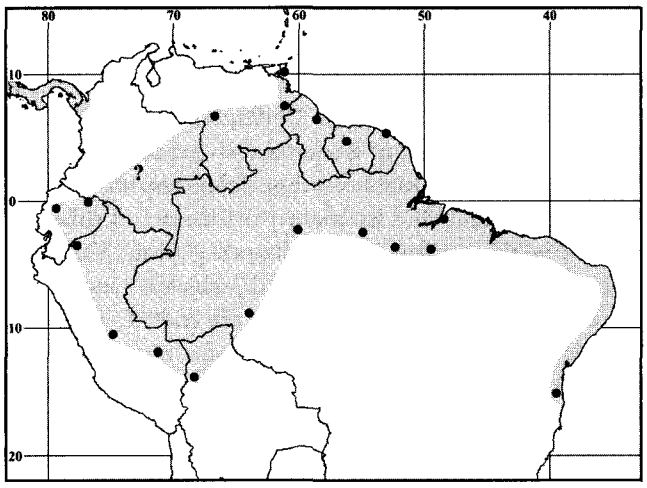
Micronycteris daviesi: J. K. Jones and Carter, 1976:10; name combination.

Micronycteris (Barticonycteris) daviesi: Eisenberg, 1989: 109; name combination.

Micronycteris [(Glyphonycteris)] daviesi: Simmons, 1996: 4; name combination.

DISTRIBUTION: *Glyphonycteris daviesi* is known from the island of Trinidad, Venezuela, Guyana, Surinam, French Guiana, Brazil, Ecuador, Peru, and Bolivia. Elsewhere, it has been found in Panama, Costa Rica, and Honduras (Pine et al. 1996).

MARGINAL LOCALITIES (Map 133; from Pine et al. 1996, except as noted): TRINIDAD AND TOBAGO: Trinidad, Victoria-Mayaro Forest Reserve (Clarke and Racey 2003). VENEZUELA: Bolívar, Reserva Florestal de Imataca (McCarthy and Ochoa 1991). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica (type locality of *Barticonycteris daviesi* Hill). SURINAM: Sipaliwini, Raleigh Falls (S. L. Williams and Genoways 1980a). FRENCH GUIANA: Piste St. Élie (Brosset and Charles-Dominique 1991). BRAZIL: Pará, Belém; Bahia, Fazenda Serra do Teimoso (Gregorin and Rossi 2005); Pará, Area do Caraipe; Pará, 52 km SSW of Altamira; Pará, Alter do Chão (Bernard and Fenton 2002); Amazonas, Dimona Reserve (Sampaio et al. 2003); Rondônia, 20 km SW of Porto Velho on road to Cachoeira Teotônio. BOLIVIA: La Paz, 25 km W of Ixiamas (S. Anderson 1997). PERU: Madre de Dios, Pakitza (S. Solari, Pacheco, and Vivar 1999); Pasco, San Juan (Tuttle 1970) Amazonas, Soledad (S. Solari, Pacheco, and Vivar 1999). ECUADOR: Pichincha, Río Palenque Field Station; Sucumbios, Zafiro (Albuja 1999). VENEZUELA: Bolívar, Serranía de los Pijiguaos.



Map 133 Marginal localities for *Glyphonycteris daviesi* ●

SUBSPECIES: We consider *G. daviesi* to be monotypic.

NATURAL HISTORY: Little is known about the natural history of *G. daviesi*. Pine et al. (1996:188) wrote that the species was "restricted or virtually restricted to lowland (0–500 m) primary wet tropical forest." Tuttle (1970) reported three individuals roosting in a hollow tree in mature forest. Hill (1965) and S. L. Williams and Genoways (1980a) reported netting *G. daviesi* in mature lowland rainforest. S. Solari, Pacheco, and Vivar (1999) captured an adult male, two adult females (one lactating), a subadult male and a young female in August that were roosting together in a tree hollow about 3 m above ground The tree was in mature forest on a mountain slope in departamento Amazonas, Peru. Pine et al. (1996) summarized the limited information on ecology, behavior, food habits, and reproduction. Information on reproduction is limited to finding lactating females in March (Panama) and August (Brazil), and a female pregnant with a 33-mm fetus in August (Peru). Of the two females Gregorin and Rossi (2005) reported from Bahia, Brazil, neither was pregnant or lactating when taken in July, although one showed nipple development indicating that she had reproduced in her lifetime, whereas the other had not. Pine et al. (1996) mentioned food items described as the remains of a frog, parts of a moth larva, and remains of other insects, thus suggesting gleaning habits, which are also indicated by the bat's morphology. Captured individuals held in cloth bags have escaped by chewing through the bag; R. H. Pine (pers. comm.) wrote that *G. daviesi* comes closer than any other bat to being a "semi-gnawing" animal. Webb and Loomis (1977) listed only one ectoparasite, a trombiculid mite. The karyotype is $2n = 28$, FN = 52 (Honeycutt, Baker, and Genoways 1980).

REMARKS: According to S. Solari, Pacheco, and Vivar (1999), two of the three bats Ascorra, Solari, and Wilson (1996) reported as *Phylloderma stenops* from Pakitza, Madre de Dios, Peru proved to be *G. daviesi*. This species was originally described as the only species in the genus *Barticonycteris*, and Hill (1965) based his diagnosis on its

massive dentition. Koopman and Cockrum (1967) treated *Barticonycteris* as a synonym of *Micronycteris*. This name combination has been used by many recent authors (see J. K. Jones and Carter 1976), although Hall (1981) treated *Barticonycteris* as a separate genus. Koopman (1978), in explaining his reasons for treating *Barticonycteris* as a subgenus of *Micronycteris*, stated that the characteristics of *Barticonycteris* "are simply those of *M. (Glyphonycteris)*, the subgenus including *sylvestris* and *behnii*, carried one step further." Hill (1965) also recognized that the closest relatives of *Barticonycteris* were species of *Glyphonycteris*.

Glyphonycteris daviesi is the largest member of the genus (forearm 53.8–58.1 mm, greatest length of skull 25.8–27.3 mm). Hill (1965), Swanepoel and Genoways (1979), Tuttle (1970), S. L. Williams and Genoways (1980a), McCarthy and Ochoa (1991), Pine et al. (1996), and Gregorin and Rossi (2005) provided measurements of *G. daviesi*. D. C. Carter and Dolan (1978) gave additional information on and measurements of the holotype of *Barticonycteris daviesi* Hill.

Glyphonycteris sylvestris (O. Thomas, 1896)
Little Graybeard Bat

SYNONYMS:

Glyphonycteris sylvestris O. Thomas, 1896b:302; type locality "Imravalles" (= Hacienda. Miravalles), Guanacaste, Costa Rica.

Micronycteris (Glyphonycteris) sylvestris: Sanborn, 1949a: 231; name combination.

DISTRIBUTION: *Glyphonycteris sylvestris* is known east of the Andes in Colombia, Venezuela, Trinidad, Surinam, French Guiana, Peru, and from an apparently isolated population in southeastern Brazil. Elsewhere, it is recorded from Panama north to western Mexico.

MARGINAL LOCALITIES (Map 132): TRINIDAD AND TOBAGO: Trinidad, Salazar Trace (Goodwin and Greenhall 1961). SURINAM: Brokopondo, 8 km S and 2 km W of Brownsweg (S. L. Williams and Genoways 1980a). FRENCH GUIANA: Saül (Brosset and Dubost 1968). BRAZIL: Pará, Guama Ecological Research Area (Handley 1967). PERU: Cusco, W side of Cordillera Vilcabamba (Koopman 1978). COLOMBIA: Caquetá, Estación Puerto Abeja (Montenegro and Romero-Ruiz 2000). VENEZUELA: Monagas, Cueva del Guácharo, Caripe (Linares 1969). *Southeastern Brazilian records.* BRAZIL: São Paulo, Iporanga (Trajano 1982); Rio de Janeiro, Parque Estadual da Pedra Branca (Dias, Silva, and Peracchi 2003); São Paulo, Estação Ecológica dos Caetetus (Pedro, Passos, and Lim 2001).

SUBSPECIES: We regard *G. sylvestris* as monotypic.

NATURAL HISTORY: This species inhabits forest habitats (Handley 1966c 1976; S. L. Williams and Genoways 1980a), and is known to roost in caves, tunnels (Hall and Dalquest 1963; Villa-R. 1967; Linares 1969), and hollow trees (Goodwin and Greenhall 1961; Handley 1976; S. L. Williams and Genoways 1980a). *Glyphonycteris sylvestris* feeds on fruit and insects (Goodwin and Greenhall 1961). Webb and Loomis (1977) listed only one ectoparasite, a streblid batfly. We suspect that the type host of the dichrocoeliid trematode *Parametadelphis compactus* Travassos, 1955, is a *G. sylvestris* misidentified as a *G. behnii*. The karyotype is $2n = 22$, FN = 40 (Honeycutt, Baker, and Genoways 1980).

REMARKS: Until recently, *G. sylvestris* was regarded as a species of *Micronycteris*, subgenus *Glyphonycteris*, which had been treated as a genus prior to Sanborn's (1949a) revision. Handley (1976) was the first author in recent years to use the name combination *Glyphonycteris sylvestris*, but did not explain his reason for recognizing *Glyphonycteris* as a full genus. Goodwin and Greenhall (1961) commented briefly on geographic variation in this species. Because *G. sylvestris* is rare in collections, and capture sites are widely separated, it has been difficult to assess any geographic trends in variation. Measurements of *G. sylvestris* have been reported by Goodwin and Greenhall (1961), Linares (1969), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), Simmons (1996), and Simmons and Voss 1998). D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Glyphonycteris sylvestris* O. Thomas.

Genus *Lampronycteris* Sanborn, 1949

Lampronycteris, represented by *Lampronycteris brachyotis*, is a monotypic genus formerly treated as a subgenus of *Micronycteris*. These are medium sized to smaller phyllostomines (forearm 38.3–42.5 mm, mean = 40.5 mm, $n = 23$; greatest length of skull 20.2–22.8 mm, mean = 21.6 mm, $n = 21$) most easily identified by the pointed ears, which have a concave upper outer rim, and by the yellow-orange to reddish fur on the throat and upper chest. Additional features (Sanborn 1949a; Simmons and Voss 1998) include the lack of a cutaneous band connecting the ears, lower rim of narial horseshoe defined by a ridge, and the lower lip and chin having a pair of smooth tubercles divided in the midline by a V-shaped groove. The third metacarpal is longer than the fourth, which is longer than the fifth. The calcar is shorter than the foot. Cranial and dental features include an inflated rostrum, especially in the lacrimal region; relatively shallow basisphenoid pits; upper inner incisors less than 1/2 the height of upper canines; upper outer incisors visible in the toothrow; and trifid lower incisors. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Schizostoma: Dobson, 1879:880; not *Schizostoma* P. Gervais, 1856a.

Lampronycteris Sanborn, 1949a:223; type species *Micronycteris (Lampronycteris) platyceps* Sanborn, 1949a, by monotypy; described as a subgenus of *Micronycteris* Gray, 1866b.

Lampronycteris brachyotis (Dobson, 1879)

Yellow-throated Bat

SYNONYMS:

Schizostoma brachyote Dobson, 1879:880; type locality "Cayenne," French Guiana.

Micronycteris brachyotis: Miller, 1900b:154; name combination.

Glyphonycteris brachyotis: Andersen, 1906a: 60; name combination.

Micronycteris (Lampronycteris) platyceps Sanborn, 1949a: 224; type locality "Guanapo, Trinidad, British West Indies."

Micronycteris (Glyphonycteris) brachyotis: Sanborn, 1949a: 233; name combination.

Micronycteris (Lampronycteris) brachyotis: Goodwin and Greenhall, 1961:230; name combination.

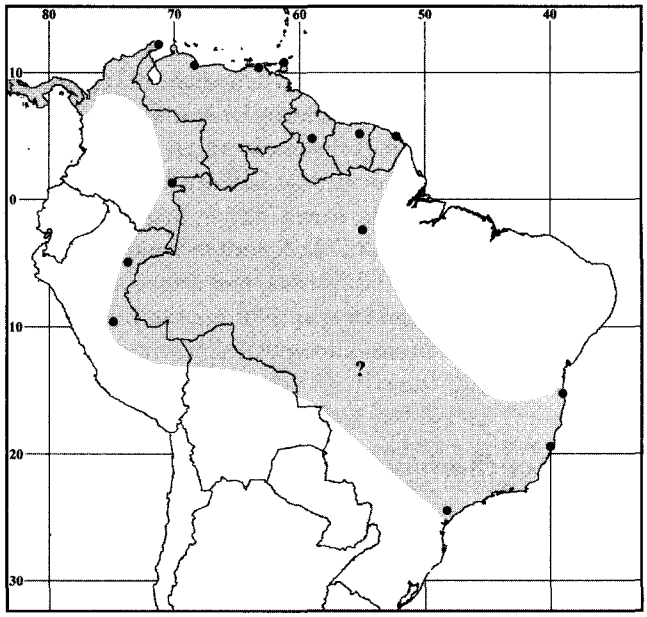
Micronycteris branchyotis Brosset, Charles-Dominique, Cockle, Cosson, and Masson 1996b:1977; incorrect subsequent spelling of *Schizostoma brachyote* Dobson.

[*Lampronycteris*] *brachyotis*: Simmons and Voss, 1998:62; first use of current name combination.

Micronycteris (L[ampronycteris].) platyops Kretzoi and Kretzoi, 2000:192; incorrect subsequent spelling of *Micronycteris (Lampronycteris) platyceps* Sanborn.

DISTRIBUTION: *Lampronycteris brachyotis* occurs east of the Andes in Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, Peru, and northwestern Brazil. The species also is in Central America and southern Mexico.

MARGINAL LOCALITIES (Map 134): COLOMBIA: Guajira, Nasaret (Marinkelle and Cadena 1972). VENEZUELA: Falcón 19 km NW of Urama (Handley 1976); Sucre, 40 km NW of Caripito [Monagas] (Arnold, Baker, and Honeycutt 1983). TRINIDAD AND TOBAGO: Trinidad, Blanchisseuse (C. H. Carter et al. 1981). GUYANA: Potaro-Siparuni, Pakatau Falls (Lim and Engstrom 2001a). SURINAM: Brokopondo, Gros (Husson 1978). FRENCH GUIANA: Cayenne (type locality of *Schizostoma brachyote* Dobson). BRAZIL: Pará, Igarapé Brabo (Koopman 1976); Bahia, Una (Faria, Soares-Santos, and Sampaio 2006); Espírito Santo, Município de Linhares (Peracchi and Albuquerque 1985); São Paulo, Gruta São José do Ribeira (Taddei and Pedro 1996). PERU: Huánuco, Panguana Biological Station (Hutterer et al. 1995); Loreto, Jenaro Herrera (S. Solari, Pacheco, and Vivar 1999). COLOMBIA: Vaupés, Durania (Marinkelle and Cadena 1972).



Map 134 Marginal localities for *Lampronycteris brachyotis* ●

SUBSPECIES: We consider *L. brachyotis* to be monotypic.

NATURAL HISTORY: Handley (1966c, 1976) associated *L. brachyotis* with forest habitats. Weinbeer and Kalko (2004), in their study on Barro Colorado Island, Isthmus of Panama, found this species to forage primarily in the forest canopy, where it gleaned insects from vegetation. Foraging strategy included perch hunting and continuous flight; and may include "hawking" insects above the canopy. Seven of the nine bats Weinbeer and Kalko (2004) studied day-roosted in a hollow tree (*Dipteryx* sp.) and each foraged in a discrete area of forest, some as far as 2.7 km from the day roost. Husson (1978) reported individuals captured in an old gold mine in an area of savannah. *Lampronycteris brachyotis* roosts in caves, mine shafts, and hollow trees (Goodwin and Greenhall 1961; Handley 1966c, 1976; Marinkelle and Cadena 1972; Husson 1978). Goodwin and Greenhall (1961) found insects and fruit in the stomachs of *L. brachyotis*. Webb and Loomis (1977) listed three streblid batflies as known ectoparasites, to which R. Guerrero (1985a) added another streblid batfly. R. Guerrero (1997) listed five species of streblids verified as parasitizing *L. brachyotis*, two of which had not been reported by Webb and Loomis (1977) and R. Guerrero (1985a). Medellín, Wilson, and Navarro (1985) reviewed the natural history and illustrated the skull of this species in their *Mammalian Species* account. The karyotype is $2n = 32$, FN = 60 (Patton and Baker 1978).

REMARKS: Until recently, *Lampronycteris brachyotis* was treated as the sole member of the subgenus *Lampronycteris* in *Micronycteris* Gray, 1866b. Goodwin and Greenhall (1961) synonymized *Micronycteris (Lampronycteris) platyceps* under *Micronycteris brachyotis*. Measurements for *L. brachyotis* have been provided by Sanborn (1949a), Goodwin and Greenhall (1961), Davis, Carter, and Pine (1964), Marinkelle and Cadena (1972), Swanepoel and Genoways (1979), C. H. Carter et al. (1981), and Taddei and Pedro (1996). D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Schizostoma brachyote* Dobson.

Genus *Lonchorhina* Tomes, 1863

The genus *Lonchorhina* contains five medium-sized species (forearm 41–60 mm, greatest length of skull 17–26 mm). These bats are easily recognized among the phyllostomines by their unusually long noseleaf, proportionally long ears, and long tail that extends to the posterior margin of the long interfemoral membrane. The calcar is longer than the foot. Cranially, these bats are readily distinguished by the presence of a concavity near the base of the rostrum, between the orbits. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Lonchorhina Tomes, 1863b:81; type species *Lonchorhina aurita* Tomes, 1863b, by monotypy.

Lonchoyhina Villa-R., 1967:209; incorrect subsequent spelling of *Lonchorhina* Tomes.

Lonchohyna Villa-R., 1967:467; incorrect subsequent spelling of *Lonchorhina* Tomes.

Lonchorrina Coimbra, Borges, Guerra, and Mello, 1982: 34, 35; incorrect subsequent spelling of *Lonchorhina* Tomes.

Lonchorrhina Portfors, Fenton, Aguiar, Baumgarten, Vonhof, Bouchard, Faria, Pedro, Rautenbach, and Zortéa, 2000:535; incorrect subsequent spelling of *Lonchorhina* Tomes.

KEY TO SOUTH AMERICAN SPECIES OF *LONCHORHINA* (MAINLY BASED ON HANDLEY AND OCHOA 1997):

1. Size large: greatest length of skull more than 22 mm; rostrum relatively long, wide, and deep with C–M3 more than 7.5 mm; breadth across upper canines more than 4.9 mm; rostral breadth more than 6.0 mm, and rostral depth more than 6.8 mm 2
1′. Smaller: greatest length of skull less than 21.5 mm; rostrum shorter, narrower, and low with C–M3 less than 7.1 mm; breadth across upper canines less than 4.7 mm; rostral breadth less than 5.6 mm, and rostral depth less than 6.6 mm 3
2. Forearm more than 59 mm; greatest length of skull more than 21.3 mm; depth of cranium less than depth of rostrum; basisphenoid pits deep anteriorly . . . . . *Lonchorhina marinkellei*
2′. Forearm 52–57 mm; greatest length of skull 22–23 mm; depth of cranium greater than depth of rostrum; basisphenoid pits shallow anteriorly . . . . . *Lonchorhina inusitata*
3. Forearm more than 47 mm; third metacarpal more than 48 mm; greatest length of skull more than 20.5 mm; forearm and proximal portion of noseleaf hairy . . . . . *Lonchorhina aurita*
3′. Forearm less than 45 mm; third metacarpal less than 43 mm; greatest length of skull less than 20 mm; forearm and proximal portion of noseleaf naked 4
4. First phalanx of digit III longer than 13 mm; dorsal pelage pale at base of hair; anterior border of ear with granulated surface; sella ovoid and short; basisphenoid pits deep posteriorly . . . . . *Lonchorhina orinocensis*
4′. First phalanx of digit III shorter than 13 mm; dorsal pelage lacks pale base; anterior border of ear lacks granulation; sella relatively large and filiform; basisphenoid pits deep posteriorly . . . . . *Lonchorhina fernandezi*

Lonchorhina aurita Tomes, 1863

Tomes's Sword-nosed Bat

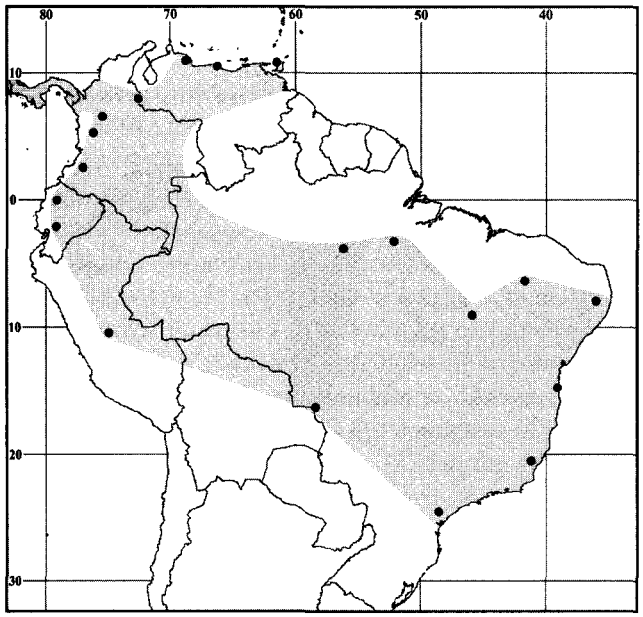
Lonchorhina aurita Tomes, 1863b:83; type locality "West Indies"; later restricted to Trinidad by O. Thomas (1893b:162).

Lonchorhina occidentalis H. E. Anthony, 1923b:13; type locality "Puente de Chimbo, Provincia del Guayas, Ecuador, altitude 1200 feet."

L[onchorhina]. a[urita]. occidentalis: Linares and Naranjo, 1973:180; name combination.

DISTRIBUTION: *Lonchorhina aurita* occurs in Colombia, Ecuador, Trinidad, eastern and northern Venezuela, eastern Peru, eastern Bolivia, and eastern Brazil. The species also is known from Central America, southern Mexico, and the Bahamas (Hall 1981).

MARGINAL LOCALITIES (Map 135): VENEZUELA (Handley 1976): Falcón, Riecito; Miranda, Birongo. TRINIDAD AND TOBAGO: Trinidad, Saut d'Eau Cave (Goodwin and Greenhall 1961). BRAZIL: Pará, Parque Nacional da Amazonia (George et al. 1988); Pará, Caverna do Valdeci (Handley and Ochoa 1997); Maranhão, Alto Parnahyba (Sanborn 1932b); Piauí, Fazenda Olho da Agua (Mares et al. 1981); Pernambuco, Pedrados dos Pontais (Handley and Ochoa 1997); Bahia, Ilhéus (Faria, Soares-Santos, and Sampaio 2006); Espírito Santo, Gruta do Limoeiro (Hernández-Camacho and Cadena 1978); São Paulo, Iporanga (Trajano 1982). BOLIVIA: Santa Cruz, San Matías (Sanborn 1932b). PERU: Pasco, San Juan (Tuttle



Map 135 Marginal localities for *Lonchorhina aurita* ●

1970). ECUADOR: Guayas, Puente de Chimbo (type locality of *Lonchorhina occidentalis* H. E. Anthony); Manabí, Chontillal (Solmsen 1985). COLOMBIA: Cauca, Tambito Nature Reserve (Dávalos and Guerrero 1999); Risaralda, Pueblorrico (Handley and Ochoa 1997); Antioquia, San Francisco (Muñoz 2001); Norte de Santander, Cúcuta (Sanborn 1949a).

SUBSPECIES: We are treating *L. aurita* as monotypic.

NATURAL HISTORY: This species is associated with forest (Tuttle 1970; Handley 1976) and disturbed (agricultural) habitats (Handley 1976). Common roosting sites of *L. aurita* are caves or tunnels (Sanborn 1932b, 1936, 1949a; Goodwin and Greenhall 1961; Greenhall and Paradiso 1968; Handley 1976; Solmsen 1985). Most reports indicate that this species is primarily insectivorous (Fleming, Hooper, and Wilson 1972; Howell and Burch 1974; Gardner 1977c); however, Fleming, Hooper, and Wilson (1972) found one individual with some fruit pulp in its stomach. Webb and Loomis (1977) listed three argasid ticks; one psorergatid, one spinturnicid, and one trombiculid mite; and one nycteribiid and seven streblid batflies as ectoparasites on *L. aurita* in their summary of ectoparasites of leaf-nosed bats. R. Guerrero (1985a) added a species of macronyssid mite and six species of streblid batflies. R. Guerrero (1997) listed 13 species of streblids, three of which had not been reported by Webb and Loomis (1977) and R. Guerrero (1985a). S. Solari, Pacheco, and Vivar (1999) reported *Trichobius petersoni* (Streblidae) recovered from a Peruvian specimen. The karyotype is $2n = 32$, FN = 60 (R. J. Baker et al. 1982).

REMARKS: *Lonchorhina aurita* has been confused with *L. inusitata*, which is known from the Guayanan lowlands of Venezuela, Surinam, and French Guiana, southward at least to the state of Rondônia, Brazil. Although several reports of *L. aurita* may yet prove to be based on misidentifications, the species nonetheless appears to be widely distributed throughout northwestern and western South America, with another segment of the species found in eastern and southeastern Brazil. Three of the other four species occur either together or in close proximity in southwestern Venezuela and eastern Colombia where *L. orinocensis* has been collected with *L. marinkellei* and *L. fernandezi*, but not with *L. aurita* or *L. inusitata* (see Ochoa and Ibáñez 1984; Ochoa and Sánchez 1988; and Handley and Ochoa 1997). Cabrera (1958) overlooked *Lonchorhina occidentalis* Anthony, 1923b, a name most authors have treated as a synonym of *L. aurita*. However, Linares and Naranjo (1973) suggested that *occidentalis* should be recognized as a subspecies of *L. aurita*, at least until additional material becomes available.

Lonchorhina aurita is medium-sized for the genus, being larger than *L. fernandezi* and *L. orinocensis*, and smaller than *L. inusitata* and *L. marinkellei*. Greatest length of skull varies from 19.8–21.3 mm, and zygomatic breadth varies from 10.0–11.1 mm (measurements combined from Ochoa and Ibáñez 1984, and Handley and Ochoa 1997). These dimensions and a forearm length of 48.8–51.9 mm (Handley and Ochoa 1997) should separate most, if not all, *L. aurita* from its morphologically closest congeners. Tuttle (1970), Linares and Ojasti (1971), Hernández-Camacho and Cadena (1978), Swanepoel and Genoways (1979), C. H. Carter et al. (1981), Ochoa and Ibáñez (1984), and Solmsen (1985) have provided measurements for *L. aurita*. D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Lonchorhina aurita* Tomes.

Lonchorhina fernandezi Ochoa and Ibáñez, 1984
Fernandez's Sword-nosed Bat

SYNONYMS:

Lonchorhina fernandezi Ochoa and Ibáñez, 1984:147; type locality "entre Puerto Ayacucho y El Burro," 40–50 km NE of Puerto Ayacucho (along the highway), Amazonas, Venezuela.

Lonchorina fernandez: Eisenberg and Redford, 1999:146; incorrect subsequent spelling of *Lonchorhina fernandezi* Ochoa and Ibáñez.

DISTRIBUTION: *Lonchorhina fernandezi* is known from the Venezuelan states of Bolívar and Amazonas, along the Río Orinoco opposite the Río Meta, which is in the general vicinity of the type locality.

MARGINAL LOCALITIES (Map 136; from Ochoa and Sánchez 1988): VENEZUELA: Bolívar, Hacienda Sagitario; Amazonas, 40–50 km NE of Puerto Ayacucho.

SUBSPECIES: We treat *L. fernandezi* as monotypic.

NATURAL HISTORY: Little is known about the ecology of *L. fernandezi*. Ochoa and Ibáñez (1984) found that the stomachs of their specimens contained parts of noctuid moths, arachnids, and unidentifiable insects. Ochoa and Sánchez (1988) examined the stomach contents of 16 specimens in which 14 contained remains of moths, 4 contained beetles, and 3 unidentified insect remains. Ectoparasites include at least one species of streblid batflies (R. Guerrero 1997) and spinturnicid mites. Nothing is known concerning reproduction or karyotype. Based on the original description (Ochoa and Ibáñez 1984) and the extensive report by Ochoa and Sánchez (1988), known specimens number 45, which are all males. This is the smallest species in the genus, with the greatest length of skull of 17.1–17.7 mm and a zygomatic breadth of 9.2–9.6 mm (Ochoa and Sánchez 1988). Additional measurements were provided by Linares (1998).

Lonchorhina inusitata Handley and Ochoa, 1997
Hairy-faced Sword-nosed Bat

SYNONYMS:

Lonchorhina aurita: Gardner, 1988:709; not *Lonchorhina aurita* Tomes, 1863b.

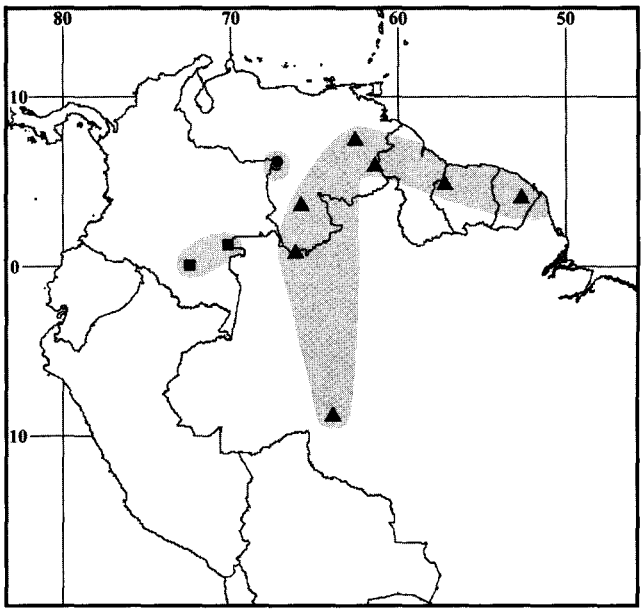
Lonchorhina inusitata Handley and Ochoa, 1997:73; type locality "Boca Mavaca, 84 km SSE Esmeralda, 2°30′N–65°13′W, 138 m, Amazonas, Venezuela."

DISTRIBUTION: *Lonchorhina inusitata* has been found at low elevation on the Guayana Shield in southern Venezuela, western Surinam, and central French Guiana, south into estado de Rondônia, Brazil.

MARGINAL LOCALITIES (Map 136; from Handley and Ochoa 1997): VENEZUELA: Bolívar, 12 km S of El Manteco; Bolívar, Km 85. SURINAM: Sipaliwini, Avanavero. FRENCH GUIANA: Grotte du Bassin du Tapir. BRAZIL: Rondônia, Porto Velho ["19 km da Cidade"]. VENEZUELA: Amazonas, Río Mawarinuma, Parque Nacional Serranía de la Neblina,; Amazonas: Belén.

SUBSPECIES: We treat *L. inusitata* as monotypic.

NATURAL HISTORY: Brosset and Charles-Dominique (1991) located a colony estimated at 300 individuals in a tight cluster (mixed with approximately 50 *Phyllostomus latifolius*) over a pool in a cave in French Guiana. Elsewhere, most of the known specimens of *L. inusitata* have been mist-netted over water. Simmons, Voss, and Peckham (2000), who considered *L. inusitata* to be a cave dweller, mist-netted nine in primary forest in French Guiana. A few have been caught in mistnets placed in the canopy of both primary and secondary forests. Stomach contents (remains of spiders and scales of moths or mosquitoes; Brosset and Charles-Dominique 1991) suggest gleaning habits, as do the morphologies of all species of *Lonchorhina*. Gardner (1988) and Brosset and Charles-Dominique (1991) reported lactating females taken in November. Handley and Ochoa (1997) mentioned a post-lactating female caught in October.



Map 136 Marginal localities for *Lonchorhina fernandezi* ●, *Lonchorhina inusitata* ▲, and *Lonchorhina marinkellei* ■

REMARKS: Many specimens of *L. inusitata* have been either misidentified as *L. aurita*, which is smaller, or more commonly as *L. marinkellei*, which is larger. Brosset et al. (1996b) reidentified as *L. inusitata* the specimens from French Guiana that Brosset and Charles-Dominique (1991) reported as *L. marinkellei*. Genoways, Williams, and Groen (1981) misidentified specimens from Avanavero, Surinam, as *L. aurita*.

Lonchorhina inusitata is much larger than either *L. fernandezi* or *L. orinocensis*. It is also larger than *L. aurita* (forearm 52.4–56.8 mm, $n = 10$, versus 48.8–51.9 mm, $n = 18$; greatest length of skull 22.0–22.9 mm, $n = 10$, versus 19.9–21.1 mm, $n = 18$) and has a longer tail. Although similar to *L. marinkellei* in shape of rostrum, and in the size, shape, and degree of hairiness of ears, noseleaf, and facial excrescences; the underparts are dark in *L. inusitata* and the basisphenoid pits are shallow anteriorly in contrast to *L. marinkellei* in which the venter is heavily washed with white and the basisphenoid pits are deep anteriorly. The rostrum is higher than the braincase in *L. marinkellei*, but of about equal height or slightly lower than the braincase in *L. inusitata*.

Lonchorhina marinkellei Hernández-Camacho and Cadena, 1978
Marinkelle's Sword-nosed Bat

SYNONYM:

Lonchorhina marinkellei Hernández-Camacho and Cadena, 1978:229; type locality "Durania (tambien conocida

como Urania), cerca a Mitu, Comisaría del Vaupés, Colombia."

DISTRIBUTION: *Lonchorhina marinkellei* is known only from two localities in Colombia.

MARGINAL LOCALITIES (Map 136): COLOMBIA: Vaupés, Urania (type locality of *Lonchorhina marinkellei* Hernández-Camacho and Cadena); Caquetá, Estación Puerto Abeja (Montenegro and Romero-Ruiz 2000).

SUBSPECIES: *Lonchorhina marinkellei* is monotypic.

NATURAL HISTORY: The holotype of *L. marinkellei* was caught, along with two specimens of *L. orinocensis*, in a small cave located in a humid forest. Montenegro and Romero-Ruiz (2000) captured five specimens in open savanna habitat, and categorized *L. marinkellei* as an aerial insectivore. Stomach contents consisted of the remains of insects. The holotype, taken in August, contained 5.8-g fetus.

REMARKS: Originally known only by the female holotype, subsequent surveys in the same area have produced additional specimens; Handley and Ochoa (1997) had two males and two females of *L. marinkellei* at hand when they described *L. inusitata*. Apparently, *L. marinkellei* is known from only two localities, both associated with tepui formations in the eastern llanos of Colombia. This is the largest species in the genus (forearm 59.1–62.3 mm, $n = 4$; greatest length of skull 25.2–25.9 mm, $n = 4$; zygomatic breadth 13.8–14.2 mm, $n = 3$; Hernández-Camacho and Cadena 1978; Handley and Ochoa 1997).

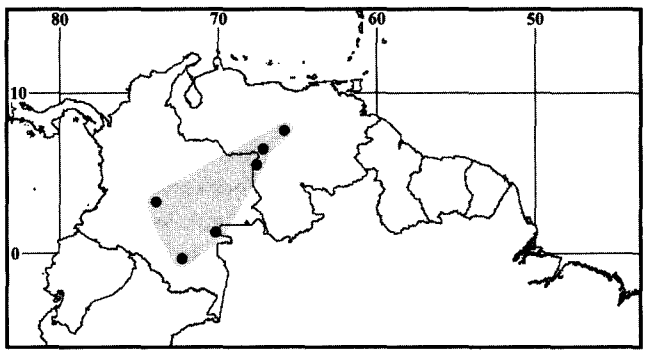
Lonchorhina orinocensis Linares and Ojasti, 1971
Orinoco Sword-nosed Bat

SYNONYM:

Lonchorhina orinocensis Linares and Ojasti, 1971:2; type locality "Boca de Villacoa, Río Orinoco (50 km. NE de Puerto Páez)," Bolívar, Venezuela.

DISTRIBUTION: *Lonchorhina orinocensis* is recorded from eastern Colombia and southwestern Venezuela.

MARGINAL LOCALITIES (Map 137): VENEZUELA: Bolívar, Hato La Florida, 35 km ESE of Caicara (Lee, Lim, and Hanson 2000); Apure: La Villa (Ochoa and Sánchez 1988); Amazonas, 28 km SSE of Puerto Ayacucho (Handley 1976). COLOMBIA: Vaupés, Durania (Hernández-Camacho and Cadena 1978); Amazonas, Caserío Araracuara (Ochoa and Ibáñez 1984); Meta, Reserva Nacional de la Macarena, cerca de Caño Cristales (Hernández-Camacho and Cadena 1978).



Map 137 Marginal localities for *Lonchorhina orinocensis* •

SUBSPECIES: We consider *L. orinocensis* to be monotypic.

NATURAL HISTORY: Little is known about the natural history of *L. orinocensis*. Handley (1976) reported this species as roosting among large rocks in llanos habitat. Individuals also were netted in yards and forests. Others have been collected in small caves located in forest habitat (Hernández-Camacho and Cadena 1978). Gardner (1977c) suggested that the food habits of *L. orinocensis* were similar to those of *L. aurita*, but this has not been confirmed. Webb and Loomis (1977) listed three argasid ticks as known ectoparasites. R. Guerrero (1985a) added one species of spinturnicid mite and five species of streblid batflies.

REMARKS: This species has been taken sympatrically with *L. fernandezi*, *L. inusitata*, and *L. marinkellei*, but not with *L. aurita* (see Ochoa and Ibáñez 1984; Handley and Ochoa 1997). *Lonchorhina orinocensis* (greatest length of skull 18.6–19.7 mm, zygomatic breadth 9.4–10.2 mm) is intermediate in size between *L. fernandezi* and *L. aurita*. Linares and Ojasti (1971), Hernández-Camacho and Cadena (1978), Swanepoel and Genoways (1979), and Ochoa and Ibáñez (1984) have provided measurements.

Genus *Lophostoma*

As currently understood, *Lophostoma* comprises seven species of small to medium-sized bats (forearm 33–56 mm, greatest length of skull 18–31 mm). Distinguishing features include the relatively narrow postorbital constriction (less than 5 mm, and less than 90% of breadth across cingula of canines), and one incisor and three premolars in each mandible (dental formula shared with species in the genera *Tonatia* and *Chrotopterus*). As in *Tonatia*, the fur is short, the calcar is longer than the foot, and the tail extends to the middle of the interfemoral membrane. However, in contrast to *Tonatia*, the fur on the face is short, and the muzzle may appear nearly naked. Simmons and Voss (1998) noted a behavioral difference between *Tonatia saurophila* and the species now included in *Lophostoma*. All species of *Lophostoma* curled their ears when handled, but the *Tonatia saurophila* did not. The dental formula is 2/1, 1/1, 2/3, 3/3 × 2 = 32 (also in *Chrotopterus* and *Tonatia*).

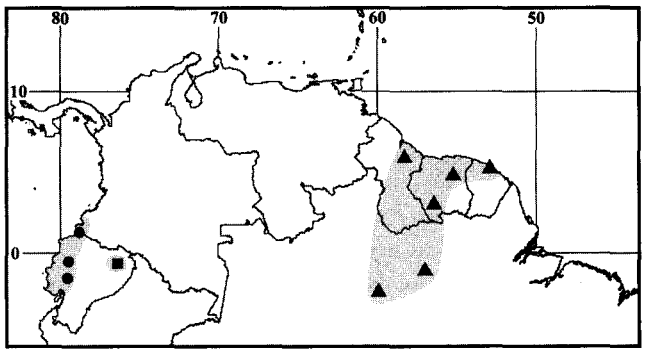
SYNONYMS:

Lophostoma d'Orbigny, 1836: pl. 6; type species *Lophostoma silvicolum* d'Orbigny, 1836: pl. 6, by monotypy.

Phyllostoma: J. A. Wagner, 1843a:365; part; not *Phyllostoma* G. Cuvier, 1800.
Vampyrus: Pelzeln, 1883:32; not *Vampyrus* Leach, 1821b.
Tonatia: Palmer, 1898:110; part; not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon 1827.
Chrotopterus: J. A. Allen, 1910b:147; part; not *Chrotopterus* W. Peters, 1865c.
Tonatia: O. Thomas, 1910b:184; part; not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon.
Tonatia: Goodwin, 1942b:205, 209; part; not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon.
Tonatia: W. B. Davis and Carter, 1978:6; part; not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon.
Tonatia: Genoways and Williams, 1980:205; part; not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon.
Tonakia Ascorra, Gorchov, and Cornejo, 1994:537; incorrect subsequent spelling of *Tonatia* of authors, not *Tonatia* Gray in Griffith, Hamilton-Smith, and Pidgeon.

KEY TO SOUTH AMERICAN SPECIES OF *LOPHOSTOMA*:

1. Forearm longer than 49 mm; greatest length of skull 26 mm or more 5
1′. Forearm shorter than 49 mm; greatest length of skull 26 mm or less 2
2. Forearm shorter than 40 mm; greatest length of skull less than 21 mm . . . . . *Lophostoma brasiliense*
2′. Forearm longer than 40 mm; greatest length of skull more than 21 mm 3
3. Forearm longer than 45 mm; fur of underparts entirely white, except on chin and sides of abdomen; lacking small wart-like granulations on head, wings, and legs; greatest length of skull more than 24 mm 4
3′. Forearm shorter than 45 mm; hair of underparts drab to grayish olive; small wart-like granulations on dorsal surfaces of forearms, digits, and legs, and on ears and noseleaf; greatest length of skull less than 24 mm . . . . . *Lophostoma schulzi*
4. Lacks post-auricular patches; margin of ear not white; basisphenoid pits shallow, almost imperceptible; sagittal crest relatively low; known only from eastern Ecuador . . . . . *Lophostoma yasuni*
4′. Has pale post-auricular patches; margin of ear usually white; basisphenoid pits well developed and divided by median septum; sagittal crest usually high and well developed . . . . . *Lophostoma carrikeri*
5. Lacks white postauricular patches; ventral pelage pale brownish olive, lightly frosted with white; second upper premolar not occluded by first upper premolar; known only from western Ecuador . . . . . *Lophostoma aequatorialis*
5′. May or may not have white postauricular patches; ventral pelage paler, often strongly frosted white; anterior surface of second upper premolar overlaid by first upper premolar; population in western Ecuador has conspicuous white postauricular patches and a whitish venter . . . . . *Lophostoma silvicolum*



Map 138 Marginal localities for *Lophostoma aequatorialis* ●, *Lophostoma schulzi* ▲, and *Lophostoma yasuni* ■

Lophostoma aequatorialis R. J. Baker, Fonseca, Parish, Phillips, and Hoffmann, 2004
Ecuadorian Round-eared Bat

SYNONYM:

Lophostoma aequatorialis R. J. Baker, Fonseca, Parish, Phillips, and Hoffmann, 2004:1; type locality "Ecuador, Province of Esmeraldas, Estación Experimental La Chiquita, near San Lorenzo town (1°16′60″N, 78°49′60″W) (UTM zone 17: 748935 E 0136902 N; 979 m)."

DISTRIBUTION: *Lophostoma aequatorialis* is known from the provinces of Esmeraldas, Los Ríos, and Pichincha, in the western lowlands of Ecuador.

MARGINAL LOCALITIES (Map 138; from R. J. Baker et al. 2004; localities listed from north to south): ECUADOR: Esmeraldas, Estación Experimental La Chiquita (type locality of *Lophostoma aequatorialis* R. J. Baker et al.); Pichincha, Estación Científica Río Palenque; Los Ríos, El Papayo.

SUBSPECIES: *Lophostoma aequatorialis* is monotypic.

NATURAL HISTORY: This species is associated with the evergreen lowland forest of the Pacific lowlands of Ecuador. Specimens from the type locality were netted at ground level in well-drained second-growth forest habitat containing shrubs and small palms (R. J. Baker et al. 2004). A lactating female was taken on 31 January at Estación Científica Río Palenque. Molecular data (R. J. Baker et al. 2004) supports a close relationship between *L. aequatorialis* and *L. schulzi*, but morphologically, *L. aequatorialis* is most similar to *L. silvicolum*. The karyotype is $2n = 34$, FN = 62 (R. J. Baker et al. 2004).

REMARKS: Three species of *Lophostoma* are known from western Ecuador, although as yet, none have been collected together. *Lophostoma brasiliense* is the smallest

species and, with a forearm length less than 40 mm, is unlikely to be confused with the other two species whose forearm lengths usually exceed 50 mm. *Lophostoma aequatorialis* is similar in size and general morphology to *L. silvicolum occidentalis* of southwestern Ecuador and northern Peru. These two taxa appear to be separated ecologically, with *L. aequatorialis* found in the remnant and second growth stands of the tropical rain forest of western and northwestern Ecuador, and *L. s. occidentalis* occupying the drier tropical deciduous forests farther south. *Lophostoma aequatorialis* also lacks the white postauricular patches and the paler, heavily frosted venter that characterizes *L. s. occidentalis*.

Lophostoma brasiliense W. Peters, 1867
Pygmy Round-eared Bat

SYNONYMS:

Lophostoma brasiliense W. Peters, 1867a:674; type locality "Baía" (= Salvador), Bahia, Brazil.

Lophostoma venezuelæ W. Robinson and Lyon, 1901:154; type locality "Macuto, [Distrito Federal,] Venezuela."

[*Tonatia*] *brasiliense*: Trouessart, 1904:111; name combination.

T[*onatia*]. *venezuelæ*: Miller, 1907b:129; name combination.

Tonatia nicaraguae Goodwin, 1942b:205; type locality "Kanawa Creek, near Cukra, north of Bluefields, [Zelaya,] Nicaragua."

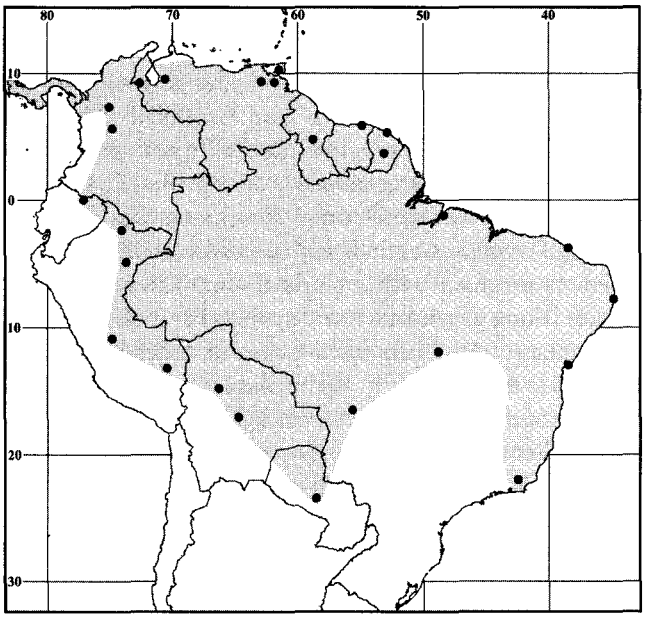
Tonatia minuta Goodwin, 1942b:209; type locality "Boca Curaray, Ecuador" (= Boca del Río Curaray, Loreto, Peru).

Tonatia brasiliensis: Handley, 1976:16; name combination and correct gender concordance.

[*Lophostoma*] *brasiliense*: Lee, Hoofer, and Van Den Bussche, 2002:55; first modern use of current name combination.

DISTRIBUTION: *Lophostoma brasiliense* occurs on the island of Trinidad and in Colombia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Ecuador, Peru; Bolivia, and Paraguay. The species also is in Mexico and Central America.

MARGINAL LOCALITIES (Map 139): TRINIDAD AND TOBAGO: Trinidad, Santa María (C. H. Carter et al. 1981). GUYANA: Potaro-Siparuni, Clearwater Camp (Lim et al. 1999). SURINAM: Commewijne, Nieuwe Grond Plantation (Genoways and Williams 1984). FRENCH GUIANA: Paracou (Simmons and Voss 1998); Les Eaux Claires (Simmons, Voss, and Peckham 2000). BRAZIL: Pará, Ilha Caratateua (Piccinini 1974)); Ceará, Faculdade de Veterinária do Ceará, Fortaleza (Piccinini 1974); Pernambuco, Refúgio Ecológico Charles Darwin (Silva and Guerra 2000); Bahia, Salvador (type locality of *Lophostoma brasiliense* W. Peters); Rio de Janeiro (no specific locality; Esbérard and Bergallo 2006); Tocantins, Município Sucupira (Nunes et al. 2005); Mato Grosso, Reserva Particular do Patrimônio Natural (Escarlate-Tavares and Pessôa 2005). PARAGUAY: Presidente Hayes, Estancia La Victoria (López-González et al. 1998). BOLIVIA: Cochabamba, Sajta (S. Anderson 1997); Beni, Estación Biológica del Beni (Wilson and Salazar 1990). PERU: Cusco, Huajyumbe (Koopman 1978); Junín, Río Perené, ca. 32 km N of Satipo (Gardner 1976); Loreto, Jenaro Herrera (Ascorra, Gorchov, and Cornejo 1994); Loreto, Boca Curaray (type locality of *Tonatia minuta* Goodwin). ECUADOR: Sucumbíos, Duvuno (Albuja 1999). COLOMBIA: Caldas, Hacienda Riomanso (Castaño et al. 2003); Antioquia, La Tirana (USNM 499293). VENEZUELA (Handley 1976, except as noted): Zulia, El Rosario, 39 km WNW of Encontrados; Trujillo, 19 km N of Valera; Monagas, Hato Mata de Bejuco; Delta Amacuro, Los Güires (Ojasti and Naranjo 1974).



Map 139 Marginal localities for *Lophostoma brasiliense* •

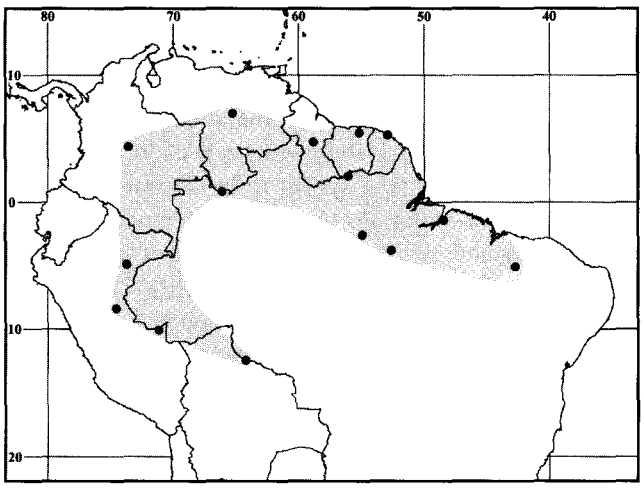
SUBSPECIES: We are treating *L. brasiliense* as monotypic.

NATURAL HISTORY: Ecological information on *L. brasiliense*, while limited and obscured by unresolved questions concerning content of the species, has been published under the name *Tonatia brasiliensis* (e.g., see Handley 1976). Genoways and Williams (1984) associated *L. brasiliense* with areas having secondary vegetation or savannah forests in Surinam. Handley (1966c) associated the species (as *Tonatia minuta*) with evergreen and deciduous forests and fruit groves in Panama, where he found it roosting in hollow termite nests. Handley (1976)

obtained specimens from forests and agricultural areas in Venezuela. Mares et al. (1981) collected *L. brasiliense* "either in Caatinga Alta habitats or near serrotes" in the Northeast of Brazil. Goodwin and Greenhall (1961) reported that termite nests are used as roosting sites for the species (as *Tonatia minuta*), also in Brazil. Gardner (1977c) wrote that the diet of *L. brasiliense* was probably fruit and insects. Graciolli and Bernard (2002) captured a female pregnant with a single 34-mm-CR fetus on 22 August along the lower Rio Tapajóz, Pará, Brazil. They also reported recovering three species of streblid flies on *L. brasiliense* from this area. Webb and Loomis (1977) listed one sarcoptid mite, one labidocarpid mite, and five streblid batflies as ectoparasites; they reported the host for the mites under the name *Tonatia venezuelae* and the host for four of the batflies under the name *Tonatia nicaraguae*. R. Guerrero (1985a) added one spinturnicid mite, one macronyssid mite, and one streblid batfly to the number of known ectoparasites. R. Guerrero (1997) listed 12 species of streblids, 5 of which had not been reported by Webb and Loomis (1977) and R. Guerrero (1985a). The karyotype is $2n = 30$, FN = 56 (Gardner 1977a; R. J. Baker 1979).

REMARKS: The common spelling in the literature is *L. brasiliense*, which is correct under the neuter generic name *Lophostoma*; but, when used under the generic name *Tonatia* should have been written as *Tonatia brasiliensis*. Apparently, W. Peters (1867:674) based the name *L. brasiliense* on the single specimen in the British Museum from Bahia that Gray had labeled *Tylostoma brasiliense*, but had not yet described. The date of publication of the name *L. brasiliense* W. Peters is usually given as 1866 (e.g., D. C. Carter and Dolan 1978); however, the pages from 657 to the end of volume 1867 (for the year 1866) of the *Monatsberichte* were published in 1867.

There has been controversy about the taxonomic status of the four nominal, small species of *Lophostoma*: *L. nicaraguae*, *L. brasiliense*, *L. minuta*, and *L. venezuelae*. We follow those authors who have treated these taxa as synonyms under the name *Tonatia brasiliensis* (see Sanborn 1932b; Ojasti and Naranjo 1974; Gardner 1976; Handley 1976; Koopman 1978, 1982; J. K. Jones and Carter 1979; C. H. Carter et al. 1981; Lemke et al. 1982; Genoways and Williams 1984). However, R. J. Baker (1979) and R. J. Baker et al. (1982) retained the names *L. brasiliense*, *L. minuta*, and *L. venezuelae*, when they reported karyotype information. Goodwin and Greenhall (1961), Swanepoel and Genoways (1979), Genoways and Williams (1980), and Simmons and Voss (1998) have provided measurements of *L. brasiliense*. D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Lophostoma brasiliense* W. Peters.



Map 140 Marginal localities for *Lophostoma carrikeri* ●

Lophostoma carrikeri (J. A. Allen, 1910)
Carriker's Round-eared Bat

SYNONYMS:

Chrotopterus carrikeri J. A. Allen, 1910b:147; type locality "Rio Mocho," Bolívar, Venezuela.

Tonatia carrikeri: Goodwin, 1942b:207; name combination.

[*Lophostoma*] *carrikeri*: Lee, Hoofer, and Van Den Bussche, 2002:55; first use of current name combination.

DISTRIBUTION: *Lophostoma carrikeri* is endemic to South America, where it is known from Colombia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Peru, and Bolivia.

MARGINAL LOCALITIES (Map 140): VENEZUELA: Bolívar, Río Mocho (type locality of *Chrotopterus carrikeri* J. A. Allen). GUYANA: Potaro-Siparuni, Clearwater Camp (Lim et al. 1999). SURINAM: Para, Zanderij (Genoways and Williams 1984). FRENCH GUIANA: Paracou (Simmons and Voss 1998). SURINAM: Sipaliwini, Sipaliwini Airstrip (Genoways and Williams 1984). BRAZIL: Pará, Belém (McCarthy and Handley 1988); Piauí, Município de Teresina (Vizotto, Dumbra, and Rodrigues 1980); Pará, Rio Iriri, 85 km SW of Altamira (McCarthy and Handley 1988); Pará, Belterra (Gribel and Taddei 1989). VENEZUELA: Amazonas, Cerro Neblina Base Camp (Gardner 1988). BOLIVIA: Beni, Río Iténez, bank opposite Costa Marquez, Brazil (Koopman 1976). PERU: Ucayali, Balta (Gardner 1976); Ucayali, Cerro Tihuayo (R. M. Fonseca and Pinto 2004); Loreto, Jenaro Herrera (R. M. Fonseca and Pinto 2004). COLOMBIA: Meta, Hacienda Los Guaduales (McCarthy, Cadena, and Lemke 1983).

SUBSPECIES: We treat *L. carrikeri* as monotypic.

NATURAL HISTORY: *Lophostoma carrikeri* is associated with a variety of forested habitats, ranging from rainforests to savannah scrub forests and orchards (Handley

1976; McCarthy, Cadena, and Lemke 1983; Genoways and Williams 1984), and roosts in hollowed-out termite nests (M. A. Carriker in J. A. Allen 1911:267; McCarthy, Cadena, and Lemke 1983). Gardner (1977c) stated that the diet was unknown, and suggested that it includes a variety of arthropods and possibly fruit. Ochoa, Castellanos, and Ibáñez (1988) found unidentifiable insect remains in the stomach of the specimen from Cerro Neblina. In their review of endoparasites in leaf-nosed bats, Ubelaker, Specian, and Duszynski (1977) mentioned a nematode reported from *L. carrikeri*. R. Guerrero (1985a) listed one species of spinturnicid mite and three species of streblid batflies recovered from this species. McCarthy, Gardner, and Handley (1992) reviewed additional records of parasites in their *Mammalian Species* account on *L. carrikeri* (under the name *Tonatia carrikeri*). The karyotype is $2n = 26$, FN = 46 (Gardner 1977a; R. J. Baker et al. 1982).

REMARKS: The type locality, as explained by J. A. Allen (1910b:145), is on a tributary of "the Rio Mato, the largest western tributary of the Rio Caura," which in turn is a major southern tributary of the Orinoco. Genoways and Williams (1984) compared the measurements of specimens from Surinam with those of specimens from elsewhere and found little variation. Males averaged larger than females in all 13 measurements (significantly larger in 9) tested by McCarthy, Cadena, and Lemke (1983). Coefficients of variation in their sample (from Colombia) ranged from 1.2 to 5.3. Goodwin (1942b, 1953), Husson (1962, 1978), Gardner (1976), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), Genoways and Williams (1980, 1984), Genoways, Williams, and Groen (1981), McCarthy, Cadena, and Lemke (1983), and McCarthy, Gardner, and Handley (1992) have provided additional measurements for *L. carrikeri*.

Lophostoma schulzi (Genoways and Williams, 1980)
Schulz's Round-eared Bat

SYNONYMS:

Tonatia schulzi Genoways and Williams, 1980:205; type locality "3 km SW Rudi Kappelvliegveld, 320 m, Brokopondo, Suriname."

[*Lophostoma*] *schulzi*: Lee, Hoofer, and Van Den Bussche, 2002:55; first use of current name combination.

DISTRIBUTION: *Lophostoma schulzi* is endemic to South America where it is known from Guyana, Surinam, French Guiana, and Brazil.

MARGINAL LOCALITIES (Map 138): GUYANA: Upper Demerara-Berbice, 3 miles S of Linden (ROM 67468; McCarthy and Handley 1988). SURINAM: Brokopondo, Brownsberg (Genoways and Williams 1984). FRENCH GUIANA: Paracou (Simmons and Voss 1998). SURINAM: Sipaliwini, Kayserberg Airstrip (Genoways, Williams, and Groen 1981). BRAZIL: Pará, Cachoeira de Porteira (Marques and Oren 1987); Amazonas, Fazenda Esteio (Griebel and Taddei 1989).

SUBSPECIES: We consider *L. schulzi* to be monotypic.

NATURAL HISTORY: Feeding habits and roosting sites of *L. schulzi* are unknown. Genoways and Williams (1984) wrote that this species has been collected only in dense, undisturbed, lowland rainforest. The specimen from Fazenda Esteio, Brazil, was mistnetted above a trail in secondary vegetation at a site surrounded by mature tropical rain forest (Gribel and Taddei 1989). McCarthy, Robertson, and Mitchell (1989) reported a 28-mm-CR fetus from a female taken 23 August in French Guiana. The karyotype is $2n = 26$, FN = 36 (Honeycutt, Baker, and Genoways 1980; R. J. Baker, Genoways, and Seyfarth 1981; R. J. Baker et al. 1982).

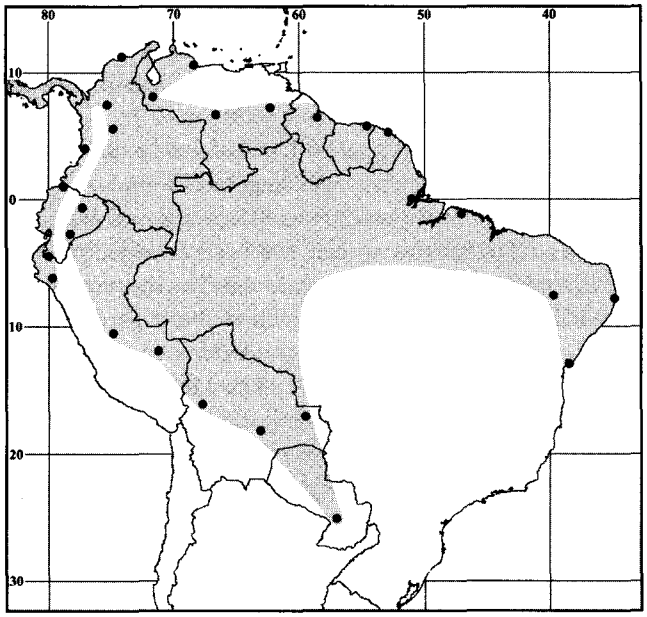
REMARKS: *Lophostoma schulzi* is a medium-sized *Lophostoma*, most closely approaching *L. carrikeri* in size. Although measurements reported by McCarthy, Cadena, and Lemke (1983) and Genoways and Williams (1984) show some overlap with *L. carrikeri* in external and cranial dimensions, *L. schulzi* averages smaller in all measurements. A unique specific character is the presence of small, wart-like granulations on the ears, noseleaf, and on the dorsal surfaces of the forearms, digits, and legs. Simmons and Voss (1998) provided measurements and repeated the advice of McCarthy, Robertson, and Mitchell (1989) about being careful to accurately sex specimens because the clitoris is elongated and can be mistaken for a penis.

Lophostoma silvicolum d'Orbigny, 1836
d'Orbigny's Round-eared Bat

SYNONYMS: See under Subspecies.

DISTRIBUTION: *Lophostoma silvicolum* is in Colombia, Venezuela, Guyana, Surinam, French Guiana, Brazil, Ecuador, Peru, Bolivia, and Paraguay. The species also occurs in Central America.

MARGINAL LOCALITIES (Map 141): VENEZUELA: Falcón 19 km NW of Urama (Handley 1976); Barinas, Reserva Forestal de Ticoporo, Unidad II (Ochoa et al. 1988); Bolívar, Serranía de lo Pijiguaos (Ochoa et al. 1988); Bolívar, Las Patos (Handley 1976). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Marowijne, 10 km N and 24 km W of Moengo (Genoways and Williams 1984). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL: Amapá, Macapá (Mok and Lacey 1980); Pará, Tauary (Goodwin 1942b); Pernambuco, Refúgio Ecológico Charles Darwin (L. A. M. Silva and Guerra 2000); Bahia, Bahia (C. O. C. Vieira 1955); Pernambuco, Fazenda Maniçoba (Willig 1983). PARAGUAY: Cordillera, 12 km (by road)



Map 141 Marginal localities for *Lophostoma silvicolum* •

N of Tobatí (Myers and Wetzel 1979). BOLIVIA: Santa Cruz, Aserradero Pontons (Brooks et al. 2002); Santa Cruz, 10 km E of Ingeniero Mora (S. Anderson 1997); La Paz, Chijchijpa (S. Anderson 1997). PERU: Madre de Dios, Pakitza (Ascorra, Wilson, and Romo 1991); Pasco, San Juan (Tuttle 1970); Lambayeque, 7 km S of Motupe (Graham and Barkley 1984); Piura, 4 miles W of Suyo (type locality of *Tonatia silvicola occidentalis* W. B. Davis and Carter). ECUADOR: Morona-Santiago, Mendéz (Albuja 1999); Napo, near Loreto (Albuja 1983); Esmeraldas, Urbina (Albuja 1999). COLOMBIA: Valle del Cauca, Cuartel B-V-83 (Alberico 1994); Caldas, Hacienda Riomanso (Castaño et al. 2003); Antioquia, Puri (J. A. Allen 1900a); Magdalena, Bonda (J. A. Allen 1900a).

SUBSPECIES: Three of the four recognized subspecies of *L. silvicolum* occur in South America. *Lophostoma s. centralis*, W. B. Davis and Carter, 1978, of Central America, is the subspecies not found in South America.

L. s. laephotis (O. Thomas, 1910)

SYNONYMS:

Tonatia læphotis O. Thomas, 1910b:184; type locality "River Supinaam, a tributary of the Lower Essequibo," Pomeroon-Supenaam, Guyana.

Tonatia loephotis Goodwin, 1942b:209; incorrect subsequent spelling of *T. laephotis* O. Thomas.

Tonatia sylvicola laephotis: Cabrera, 1958:64; name combination and incorrect subsequent spelling of *Lophostoma silvicolum* d'Orbigny.

This subspecies occurs from the Guianas to the lower Amazon basin of Brazil.

L. s. occidentalis (W. B. Davis and Carter, 1978)

SYNONYMS:

Tonatia silvicola occidentalis W. B. Davis and Carter, 1978:6; type locality "4 mi. W Suyo, 1000 ft., department of Piura, Perú."

This subspecies is known only from the Río Chira drainage basin of northwestern Peru and southwestern Ecuador.

L. s. silvicolum d'Orbigny, 1836

SYNONYMS:

Lophostoma silvicola d'Orbigny, 1836:pl. 6; type locality "le pied oriental de la Cordillere bolivienne, au pays des Juracarès" (according to Sanborn 1936:97, this is "in the Department of Yungas, between the headwaters of the rivers Secure and Isibara"); restricted by S. Anderson, Koopman, and Creighton (1982:17) to Yungas, between Río Secure and Río Isibara, 1,845 m, 15°45′S, 65°15′W, Beni, Bolivia.

Lophostoma sylvicolum d'Orbigny and Gervais, 1847:11; correction of gender agreement and incorrect subsequent spelling of *Lophostoma silvicolum* d'Orbigny.

Lophostoma sylvicola: Gray, 1838b:489; incorrect gender agreement and incorrect subsequent spelling for *Lophostoma silvicolum* d'Orbigny.

Phyllostoma amblyotis J. A. Wagner, 1843a:365; type locality "Matto Grosso, Brazil."

Ph[*yllostoma*]. *silvicola*: Schinz, 1844:238; name combination.

Lophostoma amblyotis: W. Peters, 1865c:509; name combination.

Vampyrus (*Lophostoma*) *amblyotis*: Pelzeln, 1883:32; name combination.

Phyllostoma midas Pelzeln 1883:32; in synonymy, *nomen nudum*.

Tonatia amblyotis: O. Thomas, 1902e:54; name combination.

Tonatia sylvicola: Cabrera, 1917:11; name combination and incorrect subsequent spelling of *Lophostoma silvicola* d'Orbigny.

Chrotopterus columbianus H. E. Anthony, 1920:84; type locality "Rio Quatequia, near Bogota, [Cundinamarca,] Colombia."

Tonatia silvicola: Husson, 1962:88; name combination.

Tonatia sylvicola: S. Solari, Rodriguez, Vivar, and Velasco, 2002:97; incorrect subsequent spelling of *Lophostoma silvicola* d'Orbigny.

[*Lophostoma*] *silvicolum*: Lee, Hoofer, and Van Den Bussche, 2002:55; first modern use of name combination.

L[*ophostoma*]. *silvicoulm*: R. J. Baker, R. M. Fonseca, D. A. Parish, C. J. Phillips, and F. G. Hoffmann, 2004:12; incorrect subsequent spelling of *Lophostoma silvicolum* d'Orbigny

The nominate subspecies is in Colombia, Venezuela, Paraguay, Brazil, and east of the Andes in Ecuador, Peru, and Bolivia. The subspecies also is in Panama.

NATURAL HISTORY: Hill (1965), Handley (1966c, 1976), Tuttle (1970), and Genoways and Williams (1984) have reported *L. silvicolum* (as *Tonatia silvicola*) from a variety of forest habitats. Handley (1976) also reported the species taken in agricultural clearings. This species uses termite nests, which have been hollowed out from below, for roosting sites (Sanborn 1951b; Tuttle 1970; Handley 1976; McCarthy, Cadena, and Lemke 1983; Kalko et al. 1999). The diet of *L. silvicolum* includes insects (Fleming, Hooper, and Wilson 1972; Kalko et al. 1999) and fruit (Howell and Burch 1974). Willig (1983) classified *L. silvicolum* as a foliage-gleaning insectivore. Webb and Loomis (1977), in their summary of ectoparasites, listed (under the name *Tonatia silvicola*) one argasid tick, and one nycteribiid and six streblid batflies known to infest this species. R. Guerrero (1985a) added a spinturnicid mite and three species of streblid batflies. R. Guerrero (1997) listed ten streblids, including one not previously reported by Webb and Loomis (1977) and R. Guerrero (1985a). Medellín and Arita (1989) provided a detailed description (under the name *Tonatia silvicola*), along with measurements and a summary of available information on natural history, in their *Mammalian Species* account. Kalko et al. (1999) described roosting and foraging behavior on Barro Colorado Island, Panama. The karyotype of *L. silvicolum* is $2n = 34$, FN = 60 (Honeycutt, Baker, and Genoways 1980; R. J. Baker et al. 1982).

W. B. Davis and Carter (1978), based on specimens from Panama, and Genoways and Williams (1984), based on material from Surinam, found males to be significantly larger than females in nearly 1/2 of the measurements tested. Males averaged equal to or larger than females in all other measurements in these samples, except for length of ear in the Panamanian sample. The coefficients of variation in the Surinam sample ranged from 2.0 to 4.5 and were consistently higher than for the same measurements of a sample of *Tonatia saurophila* (reported as *Tonatia bidens*) from Surinam.

REMARKS: W. B. Davis and Carter (1978) reviewed the geographic variation within *Tonatia silvicola* and concluded that there is only one species of large, round-eared bat in the *Lophostoma-Tonatia* complex in South America that has an extremely narrow postorbital constriction. They reduced *T. laephotis* to subspecific rank under *T. silvicola* and placed *T. amblyotis* in the synonymy of *T. s. silvicola*. W. B. Davis and Carter (1978) also discussed the correct spellings of the specific names *silvicola* and *laephotis*. B. D. Patterson (1992) presented evidence in his argument that d'Orbigny's (1836) spelling *silvicola* on Plate 6 was an error, and S. Anderson (1997) used the spelling *Tonatia sylvicola* based on Patterson's (1992) usage. Nevertheless, according to Article 32.2 (ICZN 1999:39), "the original spelling of a name is the 'correct original spelling,' unless it is demonstrably incorrect as provided in Article 32.5." Article 32.5 requires clear evidence in the original publication that there is an error. Article 32.5 further states that "incorrect transliteration or latinization,... are not to be considered inadvertent errors." Therefore, we consider the spelling *Lophostoma silvicolum* to be correct.

As noted by Cabrera (1958:65), the name *Phyllostoma midas* Pelzeln, 1883:32, was published in synonymy; therefore, the name is unavailable. *Phyllostoma midas* is a name Natterer had written on the labels of one or more specimens he collected in Brazil and the name was included in an unpublished catalogue of his collections.

Western Ecuadorian *L. silvicolum occidentalis* can be distinguished from *L. aequatorialis* by its whitish postauricular patches and heavily frosted ventral pelage. *Lophostoma aequatorialis* lacks the postauricular patches and has a pale olive brown venter. Otherwise, the two are similar in size and appearance.

All but three of the specimens reported as *T. bidens* by Mares et al. (1981) from northeastern Brazil represent *L. silvicolum*. Both species were taken at Fazenda Maniçoba (M. Willig, pers. comm.). Specimens reported by Fornes et al. (1967) and by Villa-R. and Villa-Cornejo (1973) as *T. silvicola* from Argentina are *T. bidens* according to Barquez, Mares, and Braun (1999). *Lophostoma silvicolum* has not been verified in Argentina, but is expected to be found there. Sanborn (1936, 1941), Goodwin (1942b, 1953), Husson (1962, 1978), W. B. Davis and Carter (1978), Swanepoel and Genoways (1979), Genoways and Williams (1980, 1984), Barquez (1984a), and Simmons and Voss (1998) have provided measurements. D. C. Carter and Dolan (1978) gave additional information on and measurements of the types of *Phyllostoma amblyotis* J. A. Wagner and *Tonatia laephotis* O. Thomas. Czaplewski, Rincón, and Morgan (2005) referred late Pleistocene material recovered from a tar seep in the Venezuelan state of Zulia to *L. silvicolum*.

Lophostoma yasuni Fonseca and Pinto, 2004
Yasuni Round-eared Bat

SYNONYM:

Lophostoma yasuni Fonseca and Pinto, 2004:1; type locality "vicinity of the Yasuní Research Station (00°30′S, 75°55′W, 220 m), Yasuní National Park and Biosphere Reserve, Province of Orellana, Ecuador."

DISTRIBUTION: *Lophostoma yasuni* is known only from the type locality in eastern Ecuador.

MARGINAL LOCALITY (Map 138): ECUADOR: Orellana, vicinity of Yasuní Research Station, Yasuní National

Park and Biosphere Reserve (type locality of *Lophostoma yasuni* Fonseca and Pinto).

SUBSPECIES: *Lophostoma yasuni* is monotypic.

NATURAL HISTORY: Fonseca and Pinto (2004) caught the holotype, an adult male, about 9 m above ground in a mistnet suspended between trees in terra firme evergreen lowland forest. No additional information is available.

Genus *Macrophyllum* Gray, 1838

The monotypic genus *Macrophyllum* is one of the smaller phyllostomines (forearm 34–39 mm, greatest length of skull 16–18 mm). *Macrophyllum* has a long tail, which extends to the posterior margin of the long interfemoral membrane, and elongated feet, which are proportionally like those of *Noctilio* and *Myotis (Pizonyx)*. Cranially, these bats can be distinguished by the presence of three lower premolars and molars, and by the size and position of the incisors and premolars. The second lower premolar is tiny and easily overlooked, and the first and third are crowded together and in or near contact. The first upper premolar is about the same size as the second (outer) upper incisor, the first upper incisor is procumbent, and the crowns of the lower incisors are broad. The dental formula is 2/2, 1/1, 2/3, 3/3 $\times$ 2 = 34.

SYNONYMS:

Phyllostoma G. Cuvier, 1800: Tab. I; part; unjustified emendation of *Phyllostomus* Lacépède, 1799b; placed on Official Index of Rejected and Invalid Names (ICZN 1955:Direction 24).

Macrophyllum Gray, 1838b:489; type species *Macrophyllum nieuwiedii* Gray, 1838b, by monotypy.

Dolichophyllum Lydekker, 1891:673, in Flower and Lydekker, 1891; replacement name for *Macrophyllum* Gray, presumed by Lydekker to be preoccupied by *Macrophylla* Hope, 1837 (Coleoptera).

Dolychophyllum Trouessart, 1904:110; incorrect subsequent spelling of *Dolichophyllum* Lydekker in Flower and Lydekker.

Mesophyllum C. O. C. Vieira, 1942:311; in synonymy; incorrect subsequent spelling of *Macrophyllum* Gray.

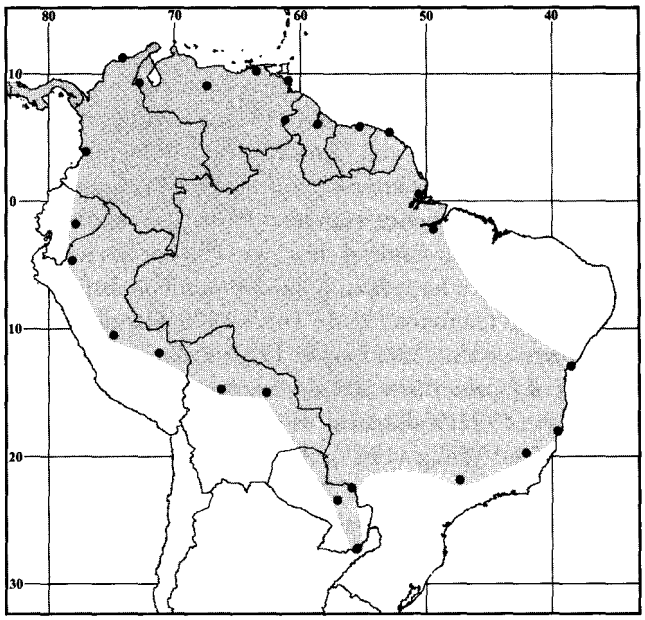
Maerophyllum George, Marques, Vivo, Branch, Gomes, and Rodrigues, 1988:39; incorrect subsequent spelling of *Macrophyllum* Gray.

Macrophyllum macrophyllum (Schinz, 1821)

Long-legged Bat

SYNONYMS:

Phyllost[oma]. macrophyllum Schinz, 1821:163; type locality "In den Wäldern von Brasilien," further defined as "Flusse Mucuri," (= Rio Mucurí, Bahia, Brazil) by Wied-Neuwied (1826:192).



Map 142 Marginal localities for *Macrophyllum macrophyllum* ●

Ph[yllostoma]. macrophyllum Wied-Neuwied, 1826:188; objective synonym and primary homonym of *Phyllostoma macrophyllum* Schinz.

Macrophyllum nieuwiedii Gray, 1838b:489; type locality "Brazil"; junior objective synonym of *Phyllostoma macrophyllum* Schinz (see Dobson 1878:136, footnote; D. C. Carter and Dolan 1978); therefore, the type locality is the Rio Mucurí, Bahia, Brazil.

Macrophyllum neuwiedii P. Gervais, 1856a:50; incorrect subsequent spelling of *Macrophyllum nieuwiedii* Gray.

Dolichophyllum macrophyllum: J. A. Allen, 1900a:91; name combination.

Macrophyllum macrophyllum: Nelson, 1912:93; first use of current name combination.

DISTRIBUTION: *Macrophyllum macrophyllum* is in Colombia, Venezuela, the Guianas, Ecuador, Peru, Bolivia, Brazil, Paraguay, and northern Argentina. The species also occurs in Central America and southern Mexico.

MARGINAL LOCALITIES (Map 142): COLOMBIA: Magdalena, Bonda (J. A. Allen 1900a). VENEZUELA (Handley 1976, except as noted): Zulia, El Rosario, 65 km WNW of Los Encontrados; Guarico, Embalse de Guárico; Monagas, Cueva de Saffont (Linares, 1966); Delta Amacuro, Caño Araguabisi (Linares and Rivas 2004); Bolívar, El Manaco, 59 km SE of El Dorado. GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Wanica, Santo Boma Locks (Husson 1978). FRENCH GUIANA: Sinnamary (Brosset and Dubost 1968). BRAZIL: Amapá, Km 160, Rodovia Perimetral Norte (Peracchi, Raimundo, and Tannure 1984); Pará, Ilha do Taiuna (Harri-

son 1975); Bahia, Bahia (P. Gervais 1856a); Bahia, Rio Mucuri (type locality of *Phyllostoma macrophyllum* Schinz); Minas Gerais, Caratinga (Taddei 1975); São Paulo, Emas (C. O. C. Vieira 1955). ARGENTINA: Misiones, San Ignacio (Fornes and Massoia 1969). PARAGUAY: Amambay, Arroyo Tacuara (Wilson and Gamarra de Fox 1991); Concepción, Belén (Baud 1989). BOLIVIA (S. Anderson 1997): Santa Cruz, Río Negrillo; Beni, Campamento El Trapiche. PERU: Madre de Dios, Pakitza (Ascorra, Wilson, and Romo 1991); Pasco, San Juan (Tuttle 1970); Amazonas, Río Cenepa (Tuttle 1970). ECUADOR: Pastaza, Putsu (Hill and Bown 1963). COLOMBIA: Valle del Cauca, Buenaventura (ROM 62588).

SUBSPECIES: We consider *M. macrophyllum* to be monotypic.

NATURAL HISTORY: *Macrophyllum macrophyllum* is commonly associated with forest habitats (Hill 1965; Tuttle 1970; Handley 1976). This species roosts in caves (Bloedel 1955; Felten 1956b; Linares 1966; Greenhall and Paradiso 1968) and in various man-made structures, including road culverts (Goldman 1920; Hill and Bown 1963; Greenhall and Paradiso 1968; Harrison and Pendleton 1975; Handley 1976; Husson 1978). Peracchi, Raimundo, and Tannure (1984) found a colony of about 50 in a 10-m-long culvert. The proximity of roosting sites to water, and the external morphological similarities this species shares with some piscivorous chiropterans, have led some authors to suggest that *M. macrophyllum* may feed on aquatic animals (W. B. Davis, Carter, and Pine 1964; Harrison 1975). Harrison and Pendleton (1975) reported *M. macrophyllum* as feeding on flying insects. Gardner (1977c) reported water striders (Hemiptera, Gerridae) as part of the diet of Panamanian *M. macrophyllum*, based on examination of stomach contents, and suggested that this species could be the only obligate insectivore in the Phyllostominae. Linares (1966) discussed the morphology and color pattern of Venezuelan specimens. Webb and Loomis (1977) listed five batflies (one nycteribiid and four streblids), one argasid tick, and one labidocarpid, one spinturnicid, and one trombiculid mite as known ectoparasites. To this, R. Guerrero (1985a) added a tick, a mite, and three streblid batflies. R. Guerrero (1997) listed ten species of streblids, four of which had not been reported by Webb and Loomis (1977) and R. Guerrero (1985a). The karyotype is $2n = 32$, FN = 56 (R. J. Baker et al. 1982).

REMARKS: The literature has been inconsistent in the placement of the type locality in Brazil. The Rio Mucuri flows from the state of Minas Gerais to the Atlantic across the southern tip of the state of Bahia. The literature refers to either Bahia (Ávila Pires 1965; Cabrera 1958; C. O. C. Vieira 1942 1955) or Minas Gerais (Hall 1981; Harrison 1975; Husson 1978) as the state where the type locality is located. The type locality is most likely in the vicinity of Morro da Arara, an old fazenda on the Rio Mucurí in the state of Bahia, and a place that Wied-Neuwied is known to have visited (see account for *Rhynchonycteris naso*). The type species of *Macrophyllum* Gray is *Macrophyllum nieuwiedii* Gray, which is a junior objective synonym of *Phyllostoma macrophyllum* Wied-Neuwied, which is, in turn, a junior objective synonym and primary homonym of *Phyllostoma macrophyllum* Schinz.

Davis, Carter, and Pine (1964), Hill (1965), Harrison (1975), Taddei (1975), and Swanepoel and Genoways (1979) have provided measurements of *M. macrophyllum*. Harrison (1975) reviewed this species and provided illustrations of the skull and dentition in his *Mammalian Species* account. He also described the longitudinal rows of denticles on the distal lower surface of the uropatagium that appear to be unique to this species.

Genus *Micronycteris* Gray, 1866

The genus *Micronycteris* is represented by at least nine small species (forearm 33–46 mm, greatest length of skull 17–25 mm). Although there is considerable variation between species, the genus is characterized by bicolored dorsal fur and relatively large, rounded ears that are connected by an interauricular band of skin (usually having a median cleft). The lower margin of the narial horseshoe is defined by a ridge, and the center of the lower lip and chin have a pair of smooth tubercles partly divided by a medial groove. The tail extends only to the middle of the interfemoral membrane. The length of the calcar, relative to the length of the foot, varies between species and is useful for identification. The upper canines are more than twice the height of inner upper incisors, the lower incisors are bifid, and there are three relatively large premolars in the lower toothrow. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34 (shared by 10 of the 15 phyllostomine genera recognized in South America).

SYNONYMS:

Phyllophora: Gray, 1842:257; not *Phyllophora* Gray, 1838b.

Phyllostoma: Gray, 1842:257; not *Phyllostoma* G. Cuvier, 1800.

Mimon Gray, 1847:14; part.

Schizostoma P. Gervais, 1856a:38; type species *Schizostoma minutum* P. Gervais, 1856a:70, by monotypy; preoccupied by *Schizostoma* Bronn, 1835 (Mollusca).

Schizastoma Gerrard, 1862:38; incorrect subsequent spelling of *Schizostoma* P. Gervais.

Micronycteris Gray, 1866b:113; type species *Micronycteris megalotis* (Gray, 1842), by monotypy.

Vampyrella Reinhardt, 1872:iii; no type species selected; intended for those species of *Schizostoma* P. Gervais

that have the ears connected by a band; preoccupied by *Vampyrella* Cienkowski, 1865 (Protozoa).

Vampyrus: Pelzeln, 1883:32; not *Vampyrus* Leach, 1821b.

Mycronycteris Festa, 1906:1; incorrect subsequent spelling of *Micronycteris* Gray.

Xenoctenes Miller, 1907b:124; type species *Schizostoma hirsutum* W. Peters, 1869, by original designation.

Chronycteris Taddei, 1976:325; incorrect subsequent spelling of *Micronycteris* Gray.

Mycronicteris Coimbra, Borges, Guerra, and Mello, 1982: 34; incorrect subsequent spelling of *Micronycteris* Gray.

Mycronycteris: Albuja, 1989:107; incorrect subsequent spelling of *Micronycteris* Gray.

ÑMicronycteris Cuartas and Muñoz, 1999:16; incorrect subsequent spelling of *Micronycteris* Gray.

REMARKS: *Micronycteris* was reviewed by Andersen (1906a), Sanborn (1949a), and more recently by Simmons (1996) and Simmons and Voss (1998). These authors, along with Honacki, Kinman, and Koeppl (1982) and Koopman (1993), overlooked the name *Vampyrella* Reinhardt, the type species of which has not been designated, *contra* Kretzoi and Kretzoi (2000:423). Following Sanborn's (1949a) revision, *Micronycteris* (*sensu stricto*) contained three species. His broader definition of the genus included six subgenera (*Glyphonycteris* O. Thomas, *Lampronycteris* Sanborn, *Micronycteris* Gray, *Neonycteris* Sanborn, *Trinycteris* Sanborn, and *Xenoctenes* Miller). Simmons and Voss (1998) added one species (*M. brosseti*); elevated *M. homezi* Pirlot to species level; retained *Xenoctenes* Miller, 1907b (*Micronycteris hirsuta*) as a synonym of *Micronycteris* (*sensu stricto*); and elevated the other four subgenera to full generic rank. Barquez et al. (2000) reported an as yet undescribed species, the first record for the genus in Argentina, from the provincia de Salta. Simmons, Voss, and Fleck (2002) described *M. matses* from northern Peru, increasing the number of species recognized in *Micronycteris* to nine. Czaplewski, Rincón, and Morgan (2005) identified several late Pleistocene fossils from northern Venezuela as *Micronycteris*, but were unable to allocate them to species.

KEY TO THE SPECIES OF *MICRONYCTERIS*:

1. Color of venter white, pale gray, or pale buff, conspicuously paler than dorsum 5
1′. Color of venter dark, approximates color of dorsum 2
2. Forearm longer than 37 mm; greatest length of skull more than 19 mm 3
2′. Forearm shorter than 37 mm; greatest length of skull less than 19 mm 4
3. Forearm longer than 41 mm; greatest length of skull more than 21 mm; lower incisors narrow and high crowned . . . . . *Micronycteris hirsuta*
3′. Forearm shorter than 41 mm; greatest length of skull less than 21 mm; lower incisors broad and low crowned . . . . . *Micronycteris matses*
4. Ear from notch usually more than 22 mm; fur on lower third of medial surface of pinna 8–10 mm in length . . . . . *Micronycteris megalotis*
4′. Ear less than 22 mm; fur on lower third of medial edge of pinna 8 mm or shorter. . . . . *Micronycteris microtis*
5. Calcar longer than foot; zygomatic breadth narrower than breadth of braincase 6
5′. Calcar equal to or shorter than foot; zygomatic breadth wider than braincase 7
6. Tibia shorter than 14.5 mm; fur on lower third of medial edge of pinna 4 mm or less. . . . . *Micronycteris brosseti*
6′. Tibia longer than 14.5 mm; fur on lower third of medial edge of pinna 5 mm or more . . . . . *Micronycteris schmidtorum*
7. First phalanx of digit IV longer than second; hairless fossa or pit between ears on top of head behind interauricular band . . . . . *Micronycteris homezi*
7′. First and second phalanges of digit IV approximately equal in length; no hairless fossa or pit on top of head 8
8. Color of venter pale gray or pale buff; basal 1/3 to 1/2 of fur on upper back white; calcar shorter than foot, thumb normal . . . . . *Micronycteris minuta*
8′. Color of venter mainly clear white; basal 2/3 to 3/4 of fur on upper back white; calcar approximately equal to length of foot; thumb small, 7.5 mm or less . . . . . *Micronycteris sanborni*

Micronycteris brosseti Simmons and Voss, 1998
Brosset's Big-eared Bat

SYNONYM:

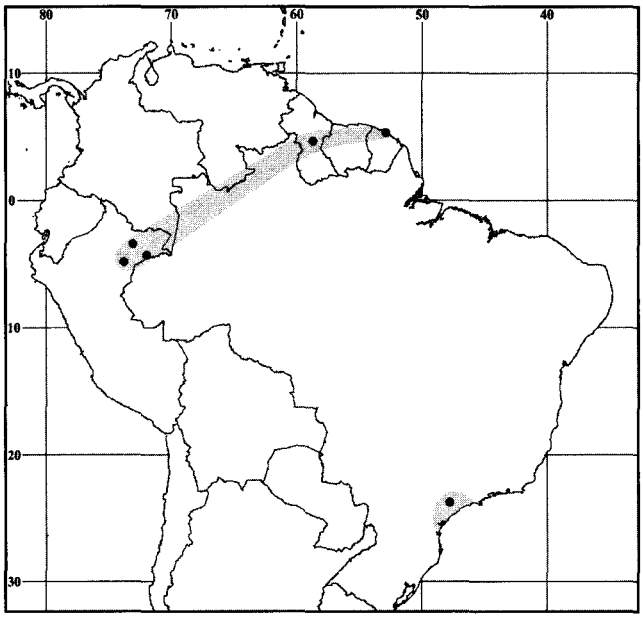
Micronycteris brosseti Simmons and Voss, 1998:62; type locality "Paracou," French Guiana.

DISTRIBUTION: *Micronycteris brosseti* is known from Guyana, French Guiana, Brazil, and Peru.

MARGINAL LOCALITIES (Map 143; from Simmons and Voss 1998, except as noted): FRENCH GUIANA: Paracou (type locality of *Micronycteris brosseti* Simmons and Voss). PERU: Loreto, Puerto Indiana; Loreto, Jenaro Herrera; Loreto, Quebrada Esperanza. GUYANA: Potaro-Siparuni, Three-Mile Camp (Lim et al. 1999). *Isolated southeastern record*: BRAZIL: São Paulo, Barra.

SUBSPECIES: We treat *M. brosseti* as monotypic.

NATURAL HISTORY: Simmons and Voss (1998) mist-netted an individual at ground level and caught seven others from a roost in a hollow tree. Both captures were within well-drained primary forest. Lim et al. (1999) reported a batfly from Guyanan *M. brosseti*. The karyotype is unknown.



Map 143 Marginal localities for *Micronycteris brosseti* •

REMARKS: Ascorra, Wilson, and Gardner (1991) reported the specimens from Jenaro Herrera, Loreto, Peru, as *M. schmidtorum*. *Micronycteris brosseti* can be distinguished from congeners by its pale gray to pale buff venter, which is distinctly paler than the dorsum (but not white as in other congeners with pale venters). Other features include the short (3 mm) fur on lower third of medial side of pinna; first phalanx of digit IV longer than second; a normal-sized thumb; and a calcar longer than the foot (Simmons and Voss 1998).

Micronycteris hirsuta (W. Peters, 1869)
Crested Big-eared Bat

SYNONYMS:

Schizostoma hirsutum W. Peters, 1869:396; type locality unknown; subsequently designated as Pozo Azul, San José, Costa Rica, by Goodwin (1946:302).

M[icronycteris]. hirsuta: Miller, 1898:330; first use of current name combination.

Xenoctenes hirsutus: Miller, 1907b:125; name combination.

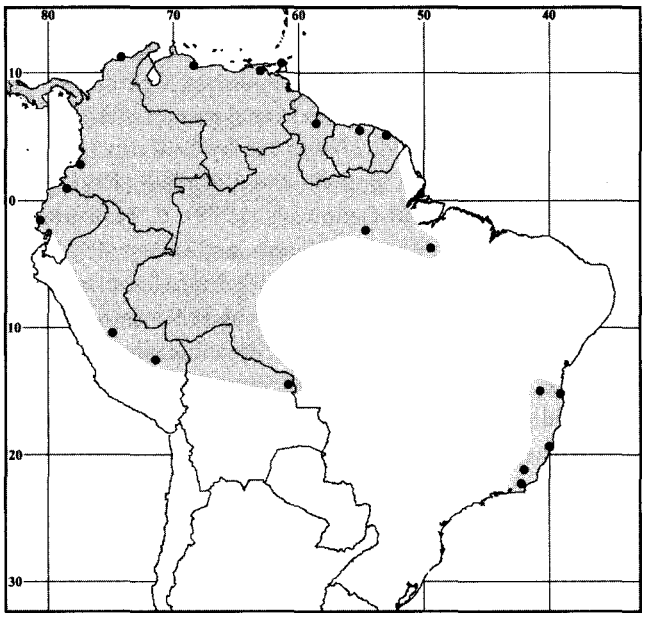
Micronycteris (Xenoctenes) hirsuta: Sanborn, 1949a:223; name combination.

DISTRIBUTION: *Micronycteris hirsuta* is known in South America from Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, Ecuador, Peru, Bolivia, and from an apparently disjunct population in southeastern Brazil. The species also occurs in Central America.

MARGINAL LOCALITIES (Map 144): *Main distribution.* COLOMBIA: Magdalena, Mamatoco (Sanborn 1932b). VENEZUELA: Falcón 19 km NW of Urama (Handley 1976); Monagas, Caripito (Arnold, Baker, and Honeycutt 1983). TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Para, Zanderij (Genoways, Williams, and Groen 1981). FRENCH GUIANA: Petit-Saut (Brosset and Charles-Dominique 1991). BRAZIL: Pará, Aramanay (AMNH 94534); Pará, Area do Caraipe (Pine et al. 1996); BOLIVIA: Santa Cruz, Los Fierros (L. Emmons, pers. comm.). PERU: Madre de Dios, 12 km above mouth of Río Palotoa (V. Pacheco et al. 1993); Pasco, San Juan (Tuttle 1970). ECUADOR (Albuja 1999): Manabí, Espuela Perdida; Esmeraldas, Hacienda La Granada. COLOMBIA: Cauca, El Papayo (Simmons 1996). *Disjunct distribution in southeastern Brazil*: Bahia, Região de Conquista (Falcão, Soares-Santos, and Drummond 2005); Bahia, Una (Faria, Soares-Santos, and Sampaio 2006); Espírito Santo, Município de Linhares (Peracchi and Albuquerque 1985); Rio de Janeiro, Paraíso do Tobias (Esbérard 2004); Rio de Janeiro, Estação Ecológica Estadual de Paraíso (Esbérard 2004).

SUBSPECIES: We treat *M. hirsuta* as monotypic; the species is in need of revision.

NATURAL HISTORY: In South America, this species is most often reported from forested habitats (Hill 1965; Tuttle 1970; Handley 1976; S. L. Williams and Genoways 1980a; Pine et al. 1996), but also has been collected in cleared areas around dwellings (Handley 1976). *Micronycteris hirsuta* is known to roost in hollow trees, under bridges, and in buildings (Goodwin and Greenhall 1961; Handley 1966c; Greenhall and Paradiso 1968. Goodwin



Map 144 Marginal localities for *Micronycteris hirsuta* •

and Greenhall (1961) stated that this species feeds primarily on fruit, but may eat some insects; however, Wilson (1971b) found *M. hirsuta* to be primarily insectivorous, and suggested its diet fluctuated with the seasons and availability of fruit. In their review of endoparasites in leaf-nosed bats, Ubelaker, Specian, and Duszynski (1977) reported a trematode found in the small intestine. Webb and Loomis (1977) listed one labidocarpid and four trombiculid mites; R. Guerrero (1997) listed one species of streblid batfly known from *M. hirsuta*.

Robert J. Baker et al. (1973) described two karyotypes for *M. hirsuta*. One chromosomal form ($2n = 30$, FN = 32) is known from Middle America and Surinam (R. J. Baker, Genoways, and Seyfarth 1981). The other cytotype, which R. J. Baker, Genoways, and Seyfarth (1981) found only in Trinidadian *M. hirsuta*, has a $2n = 28$, FN = 30 karyotype.

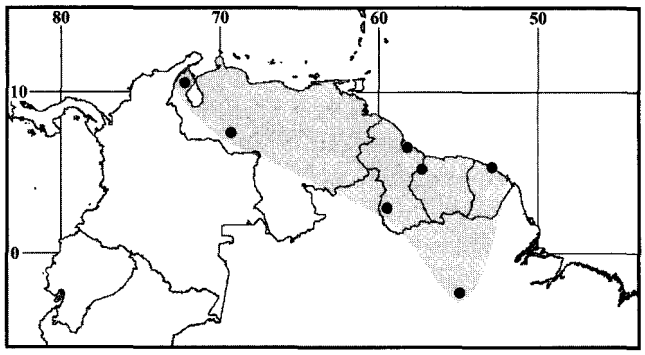
REMARKS: Miller (1907b) described *Xenoctenes* as a genus, but Sanborn (1949a) reduced it to a monotypic subgenus of *Micronycteris*. *Xenoctenes* can be distinguished from other *Micronycteris* by the following features: the ears are connected across the forehead by a low unnotched band of skin, and the metacarpal of digit III is the shortest and the metacarpal of digit V is the longest. Adult males have a conspicuous tuft, or crest, of long hair on the top of the head between the ears. The shape of the skull is similar to that of members of the subgenus *Micronycteris*. The upper outer incisors are small, but the upper inner incisors are large, separated at their bases, and in contact at their tips. Lower incisors are bifid, high crowned, and wedged tightly between canines. The cingula of the canines are in or near contact. Simmons and Voss (1998) subsumed *Xenoctenes* under *Micronycteris* and did not recognize subgenera. R. J. Baker et al. (1973) demonstrated that *M. hirsuta* from Trinidad average significantly larger in length of forearm and greatest length of skull than Central American bats of the $2n = 30$ chromosomal form. Other reports of measurements for *M. hirsuta* are by Sanborn (1932b), Hershkovitz (1949c), Goodwin and Greenhall (1961), Hill (1965), Swanepoel and Genoways (1979), C. H. Carter et al. (1981), and Genoways, Williams, and Groen (1981). D. C. Carter and Dolan (1978) provided measurements and other information on the holotype of *Schizostoma hirsutum* W. Peters. The southeastern Brazilian distribution is based on one specimen from the state of Espírito Santo (Peracchi and Albuquerque 1985) and three from the state of Rio de Janeiro (Esbérard 2004).

Micronycteris homezi Pirlot, 1967
Pirlot's Big-eared Bat

SYNONYMS:

Micronycteris megalotis homezi Pirlot, 1967:265; type locality "Hato El Cedral, Northern border, Apure State, 80 m," Venezuela, based on neotype (Ochoa and Sánchez 2005; original type localities "El Laberinto et . . . Rio Palmar," Zulia, Venezuela.

Micronycteris homezi: Simmons and Voss, 1998; first use of current name combination.



Map 145 Marginal localities for *Micronycteris homezi* •

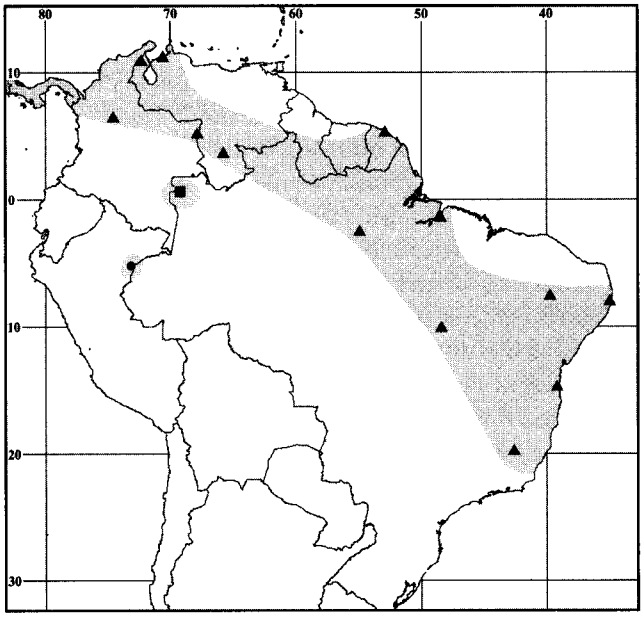
DISTRIBUTION: *Micronycteris homezi* has been recorded from Guyana, Brazil, western Venezuela, and northern French Guiana.

MARGINAL LOCALITIES (Map 145): VENEZUELA: Zulia, El Laberinto (restricted original type locality of *Micronycteris megalotis homezi* Pirlot). GUYANA: Demerara-Mahaica, Ceiba Biological Station (ROM 112573); East Berbice-Corentyne, Mango Landing (Lim and Engstrom 2001a). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL: Pará, Alter do Chão (Bernard 2001b). GUYANA: Upper Takutu-Upper Essequibo, Arakwai River, 5 km upstream from Dadanawa (Lim and Engstrom 2001a). VENEZUELA: Apure, Hato El Cedral (type locality based on neotype; Ochoa and Sánchez 2005).

SUBSPECIES: We regard *M. homezi* as monotypic (see Remarks).

NATURAL HISTORY: This was the only *Micronycteris* taken by Simmons and Voss (1998) in canopy-level mistnets, their specimen of *M. homezi* was caught at a height of 18–21 m in a gap in the canopy above a narrow dirt road in well-drained primary forest. Bernard (2001) caught an adult male in a net set at ground level within a small forest fragment surrounded by grasslands. Lim and Engstrom (2001) reported five specimens from Guyana, at least some of which were caught in ground-level nets. Apparently, although one of the paratypes described by Pirlot (1967) was identified as a female, all extant specimens are males (Ochoa and Sánchez 2005). The karyotype is unknown.

REMARKS: *Micronycteris homezi* is only tentatively recognized here. Apparently, Pirlot's (1967) original material no longer exists. The Paracou specimen Simmons and Voss (1998) identified as *M. homezi* has a bare depression located on top of the head between the ears, just behind the interauricular band. Pirlot (1967:264) illustrated this structure with a drawing. Simmons and Voss (1998) provided a vivid color photograph of their specimen while it was alive



Map 146 Marginal localities for *Micronycteris matses* ●, *Micronycteris schmidtorum* ▲, and *Neonycteris pusilla* ■

that shows the fossa, which appears to be glandular. Simmons and Voss (1998) rediagnosed *M. homezi*, provided measurements, and described its morphology in their comparisons with sympatric congeners. Bernard (2001) and Lim and Engstrom (2001) provided measurements and the latter authors commented on the similarity of their *M. homezi* with *M. minuta*. Ochoa and Sánchez (2005) rejected the interauricular fossa as diagnostic for *M. homezi* because they found a similar fossa in some *M. megalotis* and *M. microtis*. They considered *M. homezi* to be a synonym of *M. minuta*, designated a neotype, and provided evidence that Pirlot's (1967) and Simmons and Voss's (1998) descriptions of *M. homezi* were based on breeding male *M. minuta* in which the interauricular fossa becomes well developed.

Micronycteris matses Simmons, Voss, and Fleck, 2002
Matses Big-eared Bat

SYNONYM:

Micronycteris matses Simmons, Voss, and Fleck, 2002:5; type locality "Nuevo San Juan," Loreto, Peru.

DISTRIBUTION: *Micronycteris matses* is known only from the type locality, a Matses Indian village on the Río Gálvez, Loreto, Peru.

MARGINAL LOCALITY (Map 146): PERU: Loreto, Nuevo San Juan (type locality of *Micronycteris matses* Simmons, Voss, and Fleck).

SUBSPECIES: *Micronycteris matses* is monotypic.

NATURAL HISTORY: Of the eight known specimens, one was mist-netted at ground level and the others were taken from diurnal roosts, which were holes in stream banks, either dug by armadillos (assumed to be *Dasypus kappleri*) or resulting from erosion (Simmons, Voss, and Fleck 2002). Simmons, Voss, and Fleck (2002) described the habitat as lowland (150 m elevation) primary rainforest containing small tree-fall gaps and Indian gardens, which had been cleared after 1984 when the village was established. Fleck and Harder (2000) provided a more complete description of the vegetation and topography.

REMARKS: *Micronycteris matses* is larger than all congeners except *M. hirsuta*. The venter is approximately the same color as the dorsum, a feature also shared with *M. hirsuta* and the other dark-bellied *Micronycteris* (*M. megalotis* and *M. microtis*). The crowns of the lower incisors are short and broad as in other congeners with the exception of *M. hirsuta*, whose narrow, high-crowned lower incisors appear to be unique in the genus.

Micronycteris megalotis (Gray, 1842)
Brazilian Big-eared Bat

SYNONYMS:

Phyllophora megalotis Gray, 1842:257; type locality "Brazils"; restricted to Perequé, São Paulo, Brazil, by Cabrera (1958:60).

Phyllostoma elongata Gray, 1842:257; type locality "Brazils"; preoccupied by *Phyllostoma elongatum* É. Geoffroy St.-Hilaire, 1810b.

Phyllostoma elongatum: Gray, 1844:19; emendation of *Phyllostoma elongata* Gray; not *Phyllostoma elongatum* É. Geoffroy St.-Hilaire.

Mimon megalotis: Gray, 1847:14; name combination.

Phyllostoma scrobiculatum J. A. Wagner, 1855:627; replacement name for *Phyllostoma elongatum* Gray; preoccupied by *Phyllostoma elongatum* É. Geoffroy St.-Hilaire.

M[icronycteris]. megalotis: Gray, 1866b:113; first use of current name combination.

S[chizostoma]. elongatum: Gray, 1866b:115; name combination.

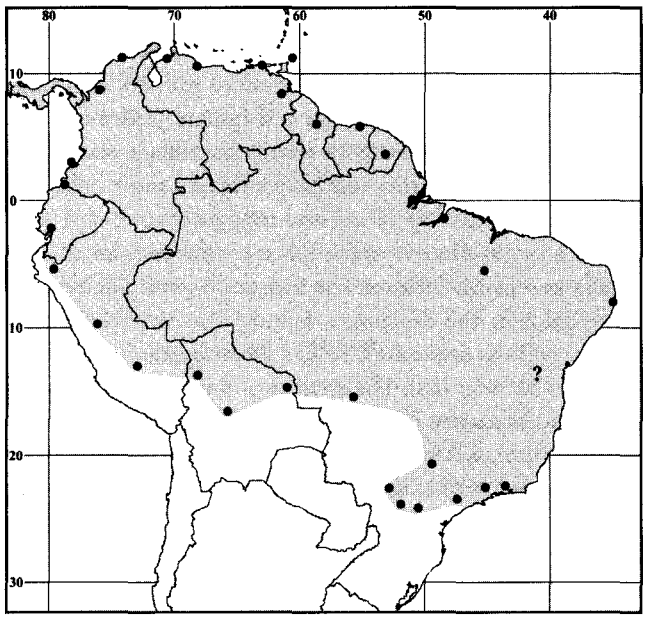
Schizostoma megalotis: W. Peters, 1867a:674; name combination.

Vampyrus (Schizostoma) elongatus: Pelzeln, 1883:32; name combination.

Phyllostoma Nattereri Pelzeln, 1883:32; in synonymy, *nomen nudum*.

DISTRIBUTION: *Micronycteris megalotis* is in Colombia, Venezuela, Trinidad and Tobago, the Guianas, Brazil, Ecuador, Peru, and Bolivia. The species also occurs in Central America and the Lesser Antilles.

MARGINAL LOCALITIES (Map 147): COLOMBIA: Magdalena, Santa Marta (Bangs 1900). VENEZUELA (Handley 1976): Falcón, Capatárida; Falcón, Boca de Yaracuy, 28 km WNW of Puerto Cabello; Sucre, Manacal. TRINIDAD AND TOBAGO: Tobago, Richmond (Ibáñez 1984a). VENEZUELA: Delta Amacuro, Raudales del Río



Map 147 Marginal localities for *Micronycteris megalotis* •

Acoíma (Rivas 2000). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Paramaribo, Paramaribo (Husson 1978). FRENCH GUIANA: Saül (Brosset and Dubost 1968). BRAZIL: Amapá, Macapá (Carvalho 1962a); Pará, Belém (Peracchi and Albuquerque 1985); Maranhão, Barra do Corda (C. O. C. Vieira 1957); Pernambuco, São Lorenço (Andersen 1906a); Rio de Janeiro, Sacra Família do Tinguá (Peracchi and Albuquerque 1985); São Paulo, Piquete (C. O. C. Vieira 1955); São Paulo, Sorocaba (C. O. C. Vieira 1955); Paraná, Fazenda Monte Alegre (N. R. Reis, Peracchi, and Sekiama 1999); Paraná, Fazenda Cagibi (Bianconi, Mikich, and Pedro 2004); Paraná, Estação Ecológica do Caiuá (Miretzki and Margarido 1999); São Paulo, Grota de Mirassol (Taddei 1975); Mato Grosso, Chapada (Andersen 1906a). BOLIVIA: Santa Cruz, El Refugio (Emmons 1998, as *M. microtis*); Cochabamba, Puerto Patiño (S. Anderson, Koopman, and Creighton 1982); La Paz, Ixiamas (S. Anderson 1997). PERU (Koopman 1978): Cusco, Cordillera Vilcabamba; Huánuco, Carpish Pass; Piura, Palambla. ECUADOR: Guayas, Guayaquil (Brosset 1965); Esmeraldas, La Chiquita (Albuja 1999). COLOMBIA (Sanborn 1932b): Cauca, Isla Gorgona; Cordoba, Jaraquiel.

SUBSPECIES: We treat *M. megalotis* as monotypic.

NATURAL HISTORY: *Micronycteris megalotis* is locally abundant in many habitats. Roosting sites include caves, mines, buildings, bridges, wells, culverts, and hollows in trees, logs, and stumps (Goodwin and Greenhall 1961; Handley 1966c, 1976; Greenhall and Paradiso 1968). Unusual roosting sites have included spaces under exposed roots along streams (Tuttle 1970), inside large mammal burrows (Hall and Dalquest 1963), and in rock piles (Handley 1976). Label information on specimens in the USNM from the island of Tobago, Trinidad and Tobago, indicates capture from under an overhang in dirt bank along a trail, and from under tree roots in a mud bank.

Valdivieso and Tamsitt (1962) categorized *M. megalotis* as a nectar-eating species, but this is unsupported (Gardner 1977c). Lasso and Jarrín (2005) compared the remains of insects gatherer from under two roosts of *M. megalotis*, each located in different habitat, during a year-long study in northwestern Ecuador. The remains of lepidopterans predominated (monthly average of 52%) among the remains from the roost in disturbed habitat (pasture land and nearby patches of disturbed forest). Beetles (Coleoptera) proved the most common prey items (monthly average of 85%) recovered from the second roost, which was at the base of a tree in primary forest at least 2 km from areas of human disturbance.

A female from the island of Tobago was pregnant with an 11-mm–CR fetus on 30 March and four were lactating in early July. Cuartas and Muñoz (1999) reported a richulariid nematode in the small intestine of a Colombian specimen. In their review, Ubelaker, Specian, and Duszynski (1977) mentioned a nematode, a trematode, and trypanosomes as endoparasites in this species. Webb and Loomis (1977) listed 11 trombiculid mites, 1 sarcoptid mite, 1 labidocarpid mite and 2 spinturnicid mites along with 1 nycteribiid and 2 streblid batflies as known ectoparasites. R. Guerrero (1985a) added a species of spinturnicid mite and a streblid batfly, and later (1997) listed eight streblids verified as parasitizing *M. megalotis* of which six had not been reported previously by Webb and Loomis (1977) or R. Guerrero (1985a). Some of the hosts for these ectoparasites likely are misidentified *M. microtis*. Alonso-Mejía and Medellín (1991) did not distinguish between *M. megalotis* and *M. microtis* in their *Mammalian Species* account on *M. megalotis*. The karyotype is $2n = 40$, FN = 68 (R. J. Baker et al. 1982).

REMARKS: We do not know how much of the foregoing information attributed to *M. megalotis* actually applies to this species. Many author have indiscriminately applied the name *M. megalotis* to all of the smaller *Micronycteris* lacking a pale venter. Although similar to congeners that have dark venters, *M. megalotis* has a longer ear (exceeds 22 mm) that also has longer fur (8–10 mm) along its lower medial margin. Longer fur on the lower medial margin of the ear is the external character emphasized by Simmons (1996) and Simmons and Voss (1998) for distinguishing *M. megalotis* from *M. microtis*. The *M. microtis* reported from the state of Bahia, Brazil by Faria, Soares-Santos, and Sampaio (2006) may prove to represent *M. megalotis*.

Taddei's (1975) coefficients of variation for a sample of *M. megalotis* from Brazil varied from 0.66 to 3.18 for cranial measurements, and from 1.77 to 5.48 for external measurements. Sanborn (1949a), Hershkovitz (1949c), Goodwin and Greenhall (1961), Husson (1962, 1978), Tamsitt and Valdivieso (1963a), Brosset (1965), J. D. Smith and Genoways (1974), Taddei (1975), Swanepoel and Genoways (1979), and C. H. Carter et al. (1981) have all reported measurements for South American specimens of this species, but their samples most likely included specimens of *M. microtis*. D. C. Carter and Dolan (1978) gave information on and measurements of the types of *Phyllostoma elongatum* Gray, *Phyllophora megalotis* Gray, and *Phyllostoma scrobiculatum* J. A. Wagner.

Micronycteris microtis Miller, 1898
Little Big-eared Bat

SYNONYMS:

Micronycteris microtis Miller, 1898:328; type locality "Greytown," (= San Juan del Norte), San Juan del Norte, Nicaragua.

Macrotus pygmaeus Rehn, 1904:444; type locality "Izamal, Yucatan," Mexico.

Micronycteris megalotis mexicana: Andersen, 1906a:54; part.

Micronycteris (Micronycteris) megalotis microtis: Sanborn, 1949a:219; name combination.

M[icronycteris]. microtis microtis: Simmons, 1996:4; name combination.

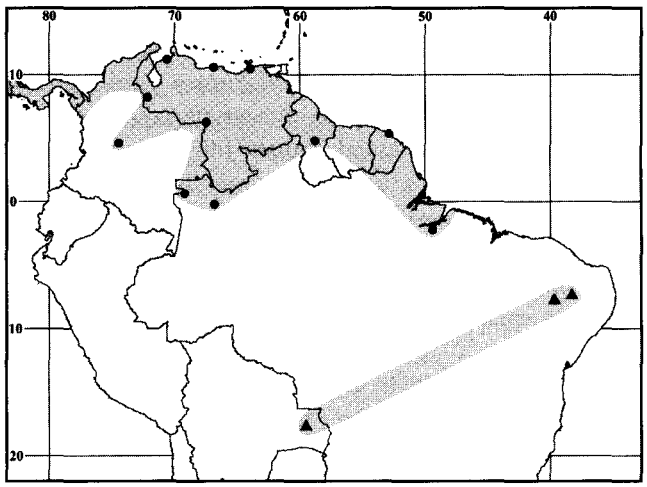
M[icronycteris]. microtis mexicana: Simmons, 1996:4; name combination.

Micronycteris microti Simmons, Voss, and Peckham, 2000: 31; incorrect subsequent spelling of *Micronycteris microtis* Miller.

DISTRIBUTION: *Micronycteris microtis* is known from Colombia, Venezuela, Guyana, French Guiana, and southern Brazil. Elsewhere, the species occurs in Central America north into western Mexico.

MARGINAL LOCALITIES (Map 148; from Simmons 1996, except as noted): VENEZUELA (Handley 1976): Falcón, Capatárida; Distrito Federal, Los Venados; Sucre, 21 km E of Cumaná. GUYANA: Potaro-Siparuni, Clearwater Camp (Lim et al. 1999). FRENCH GUIANA: Paracou. BRAZIL: Pará, Ilha do Taiuna; Amazonas, Iucali; Amazonas, Tauá. VENEZUELA: Apure, Puerto Páez (Handley 1976). COLOMBIA: Cundinamarca, Mesitas del Colegio. VENEZUELA: Táchira, Las Mesas, 17 km NE of San Juan de Colón (Handley 1976).

SUBSPECIES: Simmons (1996) recognized two subspecies: *M. microtis mexicana* in Mexico and Central America south into western Costa Rica, and the nominate subspecies in Central America from eastern Nicaragua through Panama and into South America.



Map 148 Marginal localities for *Micronycteris microtis* ● and *Micronycteris sanborni* ▲

NATURAL HISTORY: Handley (1976) found *M. microtis* roosting in hollow trees and logs, and in rock piles in Venezuela. These bats also were mist-netted, mainly near streams and other wetter areas, in a variety of sites including yards, pastures, and deciduous thorn forest. Culverts are a common roosting site in Mexico (e.g., Pine 1972a:25). The six specimens reported by Simmons and Voss (1998) were caught in ground-level mistnets: one in well-drained primary forest, four in swampy primary forest, and one in a clearing. Information on reproduction has been reported under the name *M. megalotis*, particularly for Mexican and Central American populations (see Alonso-Mejía and Medellín 1991). Brennan and Reed (1975) reported three species of trombiculid mites found on Venezuelan *M. microtis*. The karyotype ($2n = 40$, FN = 68) also has been reported under *M. megalotis* (e.g., Baker 1967:408; also see Simmons 1996:16, footnote 5).

REMARKS: Andersen (1906a) assigned specimens from the Bogotá region of Colombia to *M. megalotis mexicana* Miller, but Simmons (1996) and Simmons and Voss (1998) restricted this name, as a subspecies of *M. microtis*, to Mexican and Central American populations. Hershkovitz (1949c) stated that northern Colombian specimens of *M. megalotis megalotis* (= *M. microtis microtis*) graded into the larger *M. megalotis mexicana*. Handley (1966c) used the name *M. megalotis microtis* for Panamanian specimens, an arrangement followed by Hall (1981) and J. K. Jones and Carter (1976), who described the range of this subspecies as continuing into northwestern South America. Handley (1976) used the name *Micronycteris microtis* for specimens from Venezuela, but did not explain why he elevated the name to a full species. Simmons (1996) and Simmons and Voss (1998) reassigned *Micronycteris megalotis mexicana* Miller, to *M. microtis mexicana*. Pedro, Passos, and Lim

(2001) recorded three *M. microtis* from Estação Ecológica dos Caetetus, São Paulo, Brazil; however, considering the hiatus between that record and the known distribution of this species, we suspect these specimens, plus those reported by Faria, Soares-Santos, and Sampaio (2006) from the state of Bahia, are misidentified *M. megalotis*. The same likely is true for the *M. microtis* reported by Emmons (1998) from Parque Nacional Noël Kempff Mercado, Santa Cruz, Bolivia, and commented on by Salazar-Bravo et al. (2003); therefore, we have included her record under *M. megalotis*.

Micronycteris minuta (P. Gervais, 1856)
White-bellied Big-eared Bat

SYNONYMS:

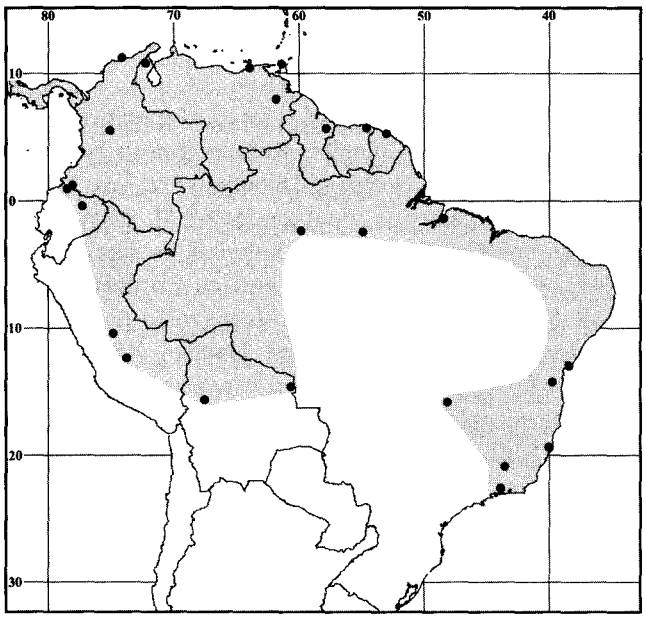
Schizostoma minutum P. Gervais, 1856a:50; type locality "Capella-Nova," Minas Gerais, Brazil.

Micronycteris hypoleuca J. A. Allen, 1900a:90; type locality "Bonda," Magdalena, Colombia.

Micronycteris minuta: O. Thomas, 1901b:191; first use of current name combination.

DISTRIBUTION: *Micronycteris minuta* is in Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, and Brazil, and in the western Amazon basin of eastern Ecuador, Peru, and Bolivia. Elsewhere, it occurs in Central America as far north as Nicaragua.

MARGINAL LOCALITIES (Map 149): COLOMBIA: Magdalena; Bonda (type locality of *Micronycteris hypoleuca* J. A. Allen). VENEZUELA (Handley 1976): Zulia, near Cerro Azul, 33 km NW of La Paz; Sucre, 21 km E of Cumaná. TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). VENEZUELA: Bolívar, El Palmar (Ochoa 1995). GUYANA: Upper Demerara-Berbice, Dubulay Ranch (USNM 582263). SURINAM: Marowijne, 10 km N and 24 km W of Moengo (Genoways and Williams 1979b). FRENCH GUIANA: Piste St. Élie (Brosset and Charles-Dominique 1991). BRAZIL: Pará, Utinga (Handley 1967); Bahia, Bahia (C. O. C. Vieira 1955); Bahia, Itagibá (Peracchi and Albuquerque 1985); Espírito Santo, Linhares (Peracchi and Albuquerque 1985); Rio de Janeiro, Piraí (Peracchi and Albuquerque 1985); Minas Gerais, Capella-Nova (type locality of *Schizostoma minutum* P. Gervais); Distrito Federal, Gruta Toca do Falcão (Bredt, Uieda, and Magalhães 1999); Pará, Alter do Chão (Bernard 2001b); Amazonas, Florestal Reserve (Sampaio et al. 2003). BOLIVIA: Santa Cruz, 27.5 km S of Campamento Los Fierros (S. Anderson 1997); La Paz, 20 km (by road) NNE of Caranavi (S. Anderson, Koopman, and Creighton 1982). PERU: Cusco, Río Mapintunare (Koopman 1978); Pasco, San Pablo (Tuttle 1970). ECUADOR: Napo, San José abajo (Simmons 1996); Esmeraldas, Hacienda La Granada (Albuja 1999). COLOMBIA: Nariño, Reserva Natural La Planada (Ospina-Ante and Gómez 2000); Caldas, Charca Guarinocito (Castaño et al. 2003).



Map 149 Marginal localities for *Micronycteris minuta* •

SUBSPECIES: We regard *M. minuta* as monotypic.

NATURAL HISTORY: This species, while often reported from forest habitats (Handley 1966c; Tuttle 1970), also is known from agricultural clearings (Handley 1976; S. L. Williams and Genoways 1980a). *Micronycteris minuta* roosts in caves, tunnels, and hollow trees (Sanborn 1949a; Goodwin and Greenhall 1961; Greenhall and Paradiso 1968; Bowles, Cope, and Cope 1979; López-González 1998). Fleming, Hooper, and Wilson (1972) described the diet as insects and plant material. Webb and Loomis (1977) listed only three ectoparasites, a streblid batfly and two spinturnicid mites. R. Guerrero (1997) increased the number of streblid batflies known to occur on *M. minuta* to four. López-González (1998) provided a detailed description, along with measurements, and a summary of available information on natural history in her *Mammalian Species* account. The karyotype is $2n = 28$, FN = 50 or 52 (R. J. Baker 1973; R. J. Baker et al. 1982).

REMARKS: Andersen (1906a) was the first to treat *Micronycteris hypoleuca* J. A. Allen as a synonym of *M. minuta* (also see Goodwin 1953). Andersen's (1906a) specimen from Santa Catherina (= Santa Catarina), Brazil represents the southernmost known distribution record for *M. minuta*. According to Simmons (1996) the *M. minuta* reported by Mares et al (1981) from the Northeast of Brazil were correctly identified as *M. megalotis* by Willig (1983). However, all of the specimens in the Carnegie Museum that Willig (1983) reported as *M. minuta* from the Brazilian states of Ceará and Pernambuco were misidentified and represent a mixed sample of *M. sanborni* and *M. schmidto-*

rum (see Simmons 1996:16, footnote 6). Sanborn (1949a), Goodwin and Greenhall (1961), Linares (1969), Bowles, Cope, and Cope (1979), Genoways and Williams (1979b), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), C. H. Carter et al. (1981), and Simmons and Voss (1998) provided measurements of *M. minuta*.

Micronycteris sanborni Simmons, 1996

Sanborn's Big-eared Bat

SYNONYMS:

Micronycteris sp. Mares, Willig, Streilein, and Lacher, 1981:104.

Micronycteris schmidtorum: Ascorra, Wilson, and Gardner, 1991:351; part; not *Micronycteris schmidtorum* Sanborn, 1935.

Micronycteris sanborni Simmons, 1996:6; type locality "Sitio Luanda, Itaitera, 4 km S of Crato," Ceará, Brazil.

DISTRIBUTION: *Micronycteris sanborni* is known from the Chapada do Araripe plateau of Ceará and Pernambuco, Brazil, and a single record from departamento Santa Cruz, Bolivia. .

MARGINAL LOCALITIES (Map 148; from Simmons 1996): BRAZIL: Ceará, Sitio Luanda (type locality of *Micronycteris sanborni* Simmons); Pernambuco, Serrote das Lajes, 17 km S of Exú. BOLIVIA: Santa Cruz, Estancia Patuju (Brooks et al. 2002).

SUBSPECIES: *Micronycteris sanborni* is monotypic.

NATURAL HISTORY: The holotype was caught in a ground-level mistnet set adjacent to a dam in relatively humid woodland. Willig (1983; also see description in Simmons 1996) described the Chapada and Caatinga habitats in the Northeast of Brazil. The Bolivian specimen came from Cerrado forest described as a mosaic of dry palm, savannah, and forest with rocky outcrops and rolling terrain (Brooks et al. 2002). The karyotype is $2n = 28$, FN = 50 (Simmons 1996).

REMARKS: Willig (1987:Table 7) gave measurements of *M. sanborni* along with those of *M. schmidtorum*, both species confused under the name *M. minuta*, which also has a white venter. *Micronycteris sanborni* is most easily distinguished from its pale-bellied congeners by its clear white venter; the conspicuously short, small thumb (7.0–7.3 mm); a calcar that is about equal to the length of the foot; and the conspicuous gap between the upper canine and adjacent incisor.

Micronycteris schmidtorum (Sanborn, 1935)

Schmidt's Big-eared Bat

SYNONYM:

Micronycteris schmidtorum Sanborn, 1935:81; type locality "Bobos, Izabal, Guatemala."

DISTRIBUTION: *Micronycteris schmidtorum* occurs in Colombia, Venezuela, French Guiana, and Brazil. Elsewhere, it is known from Central America and southern Mexico.

MARGINAL LOCALITIES (Map 146): VENEZUELA: Falcón, Capatárida (Handley 1976). FRENCH GUIANA: Paracou (Simmons 1996). BRAZIL: Pará, Belém (Simmons 1996); Pernambuco, Fazenda Alto do Ferreira (Ascorra, Wilson, and Gardner 1991); Pernambuco, Estação Ecológica do Tapacurá (Ascorra, Wilson, and Gardner 1991); Bahia, Ilhéus (Faria, Soares-Santos, and Sampaio 2006); Minas Gerais, Rio Dôce State Park (Tavares 1999; Tavares and Taddei 2003); Tocantins, Paraíso do Tocantins (Nunes et al. 2005); Pará, Alter do Chão (Bernard 2001b). VENEZUELA: Amazonas, Belén (Handley 1976). COLOMBIA: Vichada, Maipures (Simmons 1996); Antioquia, Puerto Nare (Cuartas and Muñoz 1999). VENEZUELA: Zulia, near Cerro Azul, 40 km NW of La Paz (Handley 1976).

SUBSPECIES: We consider *M. schmidtorum* to be monotypic.

NATURAL HISTORY: Little is known about the ecology of South American populations. Handley (1976) reported *M. schmidtorum* roosting in tree holes and recorded captures of this species from a variety of habitats including evergreen forest, thorn forest, swamps, pastures, and orchards. Howell and Burch (1974) stated that Costa Rican animals ate insects; Gardner (1977c) suggested that the diet also included fruit. Cuartas and Muñoz (1999) found trichostrongylid nematodes in the small intestine of Colombian *M. schmidtorum*. R. Guerrero (1997) listed two species of streblid batflies as ectoparasites. The karyotype is $2n = 38$, FN = 66 (R. J. Baker 1973; R. J. Baker et al. 1982).

REMARKS: *Micronycteris schmidtorum* can be distinguished from congeners by the following combination of characters: the calcar is longer than the foot; the interfemoral membrane is more than twice the length of the tail; fur on venter is paler than on the dorsum, usually grayish white to pale buff; upper premolars are about equal in height; and the second lower premolar is about 3/4 the size of the first. The specimens from Sitio Luanda, Ceará, Brazil, and from Jenaro Herrera, Loreto, Peru, reported by Ascorra, Wilson, and Gardner (1991) as *M. schmidtorum* were reidentified by Simmons (1996) and Simmons and Voss (1998) as *M. sanborni* and *M. brosseti*, respectively. Swanepoel and Genoways (1979) gave measurements for South American specimens. Tavares and Taddei (2003) summarized additional measurements for a total of 35 specimens from throughout the range of the species.

Genus *Mimon* Gray, 1847

The genus *Mimon* is represented by four medium-sized species (forearm 45–61 mm, greatest length of skull 21–28 mm).

These are the only bats in the subfamily that have a lower toothrow with only one incisor and two premolars. The tail extends to the middle of the long interfemoral membrane, and the calcar is longer than the foot. The dental formula is 2/1, 1/1, 2/2, 3/3 × 2 = 30.

SYNONYMS:

Mimon Gray, 1847:14; type species *Phyllostoma bennettii* Gray, 1838b, by subsequent designation (Palmer 1904:426).

Tylostoma P. Gervais, 1856a:49; part.

Vampirus Saussure, 1860:487; part; incorrect subsequent spelling of *Vampyrus* Leach, 1821b.

Tylostomum Pelzeln, 1883:31; incorrect subsequent spelling of *Tylostoma* P. Gervais.

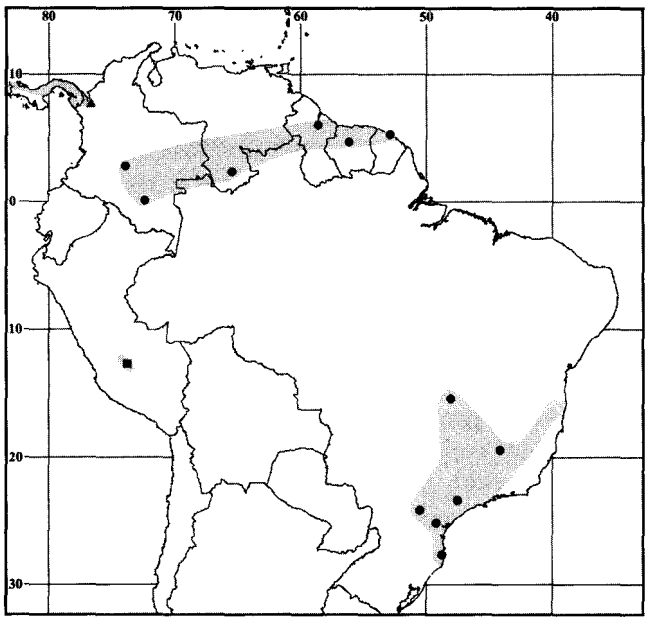
Anthorhina Lydekker, 1891:674, in Flower and Lydekker 1891; part.

Mimon [*(Anthorhina)*]: Cabrera, 1958:66; name combination.

Mimmon Dias, Peracchi, and Silva, 2002:113; incorrect subsequent spelling of *Mimon* Gray.

KEY TO SPECIES OF *MIMON*:

1. Margin of noseleaf crenulated and fringed with straight hairs; pale dorsal median stripe present or absent; wing membrane attached to side of foot; forearm 45–51 mm; greatest length of skull 21–23 mm 2
1′. Margin of noseleaf entire; dorsal coloration fulvous brown, no white line on back; wing membrane attached to ankle; forearm 54–61 mm; greatest length of skull 25–28 mm 3
2. Dorsal fur grayish to blackish brown; pale, usually white, dorsal stripe along midline (may be faint in some individuals); no vertical groove between protocone and hypocone on lingual cingulum of M1 and M2 . . . . . *Mimon crenulatum*
2′. Dorsal fur reddish to golden brown; dorsal stripe absent; shallow vertical groove between protocone and hypocone on lingual cingulum of M1 and M2 . . . . . *Mimon koepckeae*
3. Mesopterygoid fossa V-shaped; mandible longer than 16.7 mm; second lower premolar (p4) with enlarged posterior cingulum and lacking a small cuspulid on posterior cristid of main cusp next to posterior cingulum; post-auricular patches grayish white and distinct; 34 chromosomes . . . . . *Mimon cozumelae*
3′. Mesopterygoid fossa U-shaped; mandible shorter than 16.7 mm; second lower premolar (p4) with posterior cingulum reduced, but with a small cuspulid on posterior cristid near posterior cingulum; post-auricular patches buff, often not distinct; 30 chromosomes . . . . . *Mimon bennettii*



Map 150 Marginal localities for *Mimon bennettii* ●, *Mimon cozumelae* ▲, and *Mimon koepckeae* ■

Mimon bennettii (Gray, 1838)

Bennett's Spear-nosed Bat

SYNONYMS:

Phyllostoma bennettii Gray, 1838b:488; type locality "S. America"; subsequently restricted to Ypanema, São Paulo, Brazil, by Hershkovitz (1951:555).

V[ampirus]. auricularis Saussure, 1860:487; type locality "Brésil."

M[imon]. bennettii: Gray, 1847:14; first use of current name combination.

Mimon bennetti N. R. Reis, Peracchi, and Sekiama, 1999:503; incorrect subsequent spelling of *Phyllostoma bennettii* Gray.

DISTRIBUTION: *Mimon bennettii* is endemic to South America where it occurs as two separate populations: one in Colombia, Venezuela, and the Guianas, the other in southeastern Brazil.

MARGINAL LOCALITIES (Map 150): *Northern distribution.* GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Sipaliwini, Voltzberg (Genoways, Williams, and Groen 1981). FRENCH GUIANA: Paracou (Simmons and Voss 1998). VENEZUELA: Amazonas, western border of Río Mavaca (Molina, García, and Ochoa 1995). COLOMBIA: Caquetá, Estación Puerto Abeja (Montenegro and Romero-Ruiz 2000); Meta, Serranía de La Macarena (Cuervo-Díaz, Hernández-Camacho, and Cadena 1986). *Southern distribution.* BRAZIL: Bahia, Pardo River Valley (Faria, Soares-Santos, and Sampaio 2006, not mapped); Minas Gerais,

3 miles ESE of Sete Lagoas (Molina, García, and Ochoa 1995); São Paulo, Ipanema (type locality of *Phyllostoma bennettii* Gray); Paraná, Gruta da Lancinha II (Graciolli 2004); Santa Catarina, Santo Amaro da Imperatriz (Cherem et al. 2005); Paraná, Fazenda Monte Alegre (N. R. Reis, Peracchi, and Sekiama 1999); Goiás, Gruta Morro (Bredt, Uieda, and Magalhães 1999).

SUBSPECIES: We treat *M. bennettii* as monotypic, although the unusual distribution pattern suggests that the northern component represents an unnamed subspecies.

NATURAL HISTORY: Hill (1965) and Genoways, Williams, and Groen (1981) found *M. bennettii* associated with forest habitats. Genoways, Williams, and Groen (1981) reported this species roosting in caves and in crevices in granitic extrusions in Surinam. Simmons and Voss (1998) found one *M. bennettii* roosting in a large hollow tree in French Guiana. Montenegro and Romero-Ruiz (2000) found *M. bennettii* in *terra firme* forests in southern Colombia. Ortega and Arita (1997) provided a detailed description, along with measurements and a summary of available information on natural history, in their *Mammalian Species* account. Gardner (1977c) gave the diet as insects and fruits. Molina, García, and Ochoa (1995) found the remains of carabid beetles in the stomach of their Venezuelan specimen. Ubelaker, Specian, and Duszynski (1977) listed a *Trypanosoma cruzi*-like endoparasite for Colombian specimens. Graciolli (2004) listed a nycteribiid batfly recovered from specimens from Paraná, Brazil. The karyotype is $2n = 30$, FN = 56 (R. J. Baker, Genoways, and Seyfarth 1981; R. J. Baker et al. 1982).

REMARKS: As understood herein, *M. bennettii* is confined to the lowlands of Venezuela and the Guianas, with a separate distribution in southeastern Brazil. Some recent authors, beginning with Schaldach (1965), have treated *M. cozumelae* of Middle America as a subspecies of *M. bennettii* (also see J. K. Jones 1966; Goodwin 1969; Hall 1981; Koopman 1982, 1993, 1994). Other authors have continued to treat *M. cozumelae* as a separate species (D. C. Carter, Pine, and Davis 1966; Handley 1966c; Gardner, LaVal, and Wilson 1970; Marinkelle and Cadena 1972; J. K. Jones, Smith, and Genoways 1973; J. K. Jones and Carter 1976; Genoways, Williams, and Groen 1981; Molina, Garcia, and Ochoa 1995; Simmons and Voss 1998). Those who have synonymized these two taxa, claim there is little morphological difference between them and that their relationships are best expressed by placing them in a single species. On the other hand, authors who have continued to recognize both as different species contended that no intergradation has been demonstrated between them and each has a different karyotype. Simmons and Voss (1998) illustrated the skulls and dentition, and noted that adult *M. bennettii*, in contrast to *M. cozumelae*, are redder dorsally and have dark wing tips, upper inner incisors tapering to points, narrower lower incisors, a larger talonid on m3, and a U-shaped anterior border of the mesopterygoid fossa (a feature we use in the identification key). Measurements of *M. bennettii* can be found in C. O. C. Vieira (1942), Dalquest (1957a), Husson (1962, 1978), Hill (1965), Swanepoel and Genoways (1979), and Genoways, Williams, and Groen (1981).

The known distributions of *M. bennettii* and *M. cozumelae* are separated by a broad gap in northeastern Colombia and northern Venezuela. Although this cannot be taken as proof that these taxa do not occur in this region, it should be remembered that the chiropteran fauna of Venezuela has been studied extensively in recent years (Butterworth and Starrett 1964; Ojasti 1966; Linares 1969, 1998; J. D. Smith and Genoways 1974; Handley 1976). We believe it is best to treat these taxa as separate species. The J. A. Allen (1911) report of *M. bennettii* from Venezuela was based on a misidentified *Chrotopterus auritus*.

Mimon cozumelae Goldman, 1914
Cozumel Spear-nosed Bat

SYNONYMS:

Mimon cozumelae Goldman, 1914b:75; type locality "Cozumel Island," Quintana Roo, Mexico.

Mimon bennettii cozumelae: Schaldach, 1965:132; name combination.

M[*imon*]. *cazumelae* Molina, García, and Ochoa, 1995:264; incorrect subsequent spelling of *Mimon cozumelae* Goldman.

DISTRIBUTION: The only South American record for *M. cozumelae* is from Chigorodó, Antioquia, Colombia. Elsewhere, the species is known from southern Mexico and Central America.

MARGINAL LOCALITY (Map 150): COLOMBIA: Antioquia, Chigorodó (Marinkelle and Cadena 1972).

SUBSPECIES: We consider *M. cozumelae* to be monotypic.

NATURAL HISTORY: The habitats and feeding habits of *M. cozumelae* are probably similar to those of *M. bennettii*. In Mexico and Central America, *M. cozumelae* has been found roosting in caves, tunnels, culverts, and similar structures (Hall and Dalquest 1963; Handley 1966c; Villa-R. 1967; Greenhall and Paradiso 1968). Gardner (1977c) characterized the diet as "plant material and various arthropods." The species also may be carnivorous (Hall and Dalquest 1963). Webb and Loomis (1977) listed two trombiculid mites as known ectoparasites of *M. cozumelae*. The karyotype is $2n = 34$, FN = 56 (R. J. Baker 1979) or FN = 60 (Patton and Baker 1978).

REMARKS: *Mimon cozumelae*, as understood here, is known in South America only from one locality in northwestern Colombia near the Panamanian border, where three individuals were collected. One was an adult male with a forearm of 56.5 mm, another a juvenile male with a forearm of 33.0 mm (Marinkelle and Cadena 1972). No other measurements are known for South American representatives of this species, but see D. C. Carter, Pine, and Davis (1966) and Swanepoel and Genoways (1979) for measurements of individuals from Middle America.

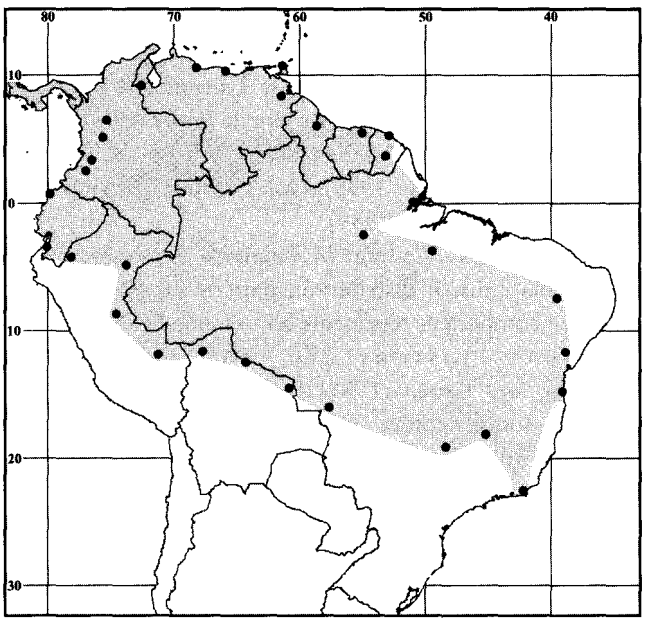
Mimon cozumelae and *M. bennettii* are similar morphologically, but we have noted the following differences between specimens from Belize and Surinam, respectively, in the collections of the Carnegie Museum of Natural History. The lower jaw is longer in *M. cozumelae* (greater than 16.7 mm) and a small cuspulid is present on the posterior lingual cristid of the second lower premolar (p4) near the junction with the posterior cingulum, but missing in *M. bennettii*. The anterior border of the mesopterygoid fossa of *M. cozumelae* tends to be V-shaped as opposed to U-shaped in *M. bennettii*. The postauricular patches of *M. cozumelae* are grayish white and conspicuous; whereas, these patches in *M. bennettii* tend to be reddish to buff and are less distinct. Simmons and Voss (1998) mentioned and illustrated some of these features and concluded that *M. bennettii* and *M. cozumelae* were separate species. *Mimon cozumelae* has 34 chromosomes, but *M. bennettii* has 30, a difference requiring at least two chromosomal rearrangements to derive one from the other (R. J. Baker, Genoways, and Seyfarth 1981).

Mimon crenulatum (É. Geoffroy St.-Hilaire, 1803)
Striped Spear-nosed Bat

SYNONYMS: See under Subspecies.

DISTRIBUTION: *Mimon crenulatum* is in Colombia, Venezuela, Trinidad, the Guianas, Brazil, Ecuador, Peru, and Bolivia. The species also occurs in Mexico and Central America.

MARGINAL LOCALITIES (Map 151): VENEZUELA (Handley 1976): Falcón, Boca de Yaracuy; Miranda, 7 km E of Río Chico. TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). VENEZUELA: Delta Amacuro, Río Acoíma (Ochoa 1995). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Para, Powaka (Genoways and Williams 1979b). FRENCH GUIANA: Paracou (Simmons and Voss 1998); Les Eaux Claires (Simmons, Voss, and Peckham 2000). BRAZIL: Amapá, Macapá (Mok and Lacey 1980); Pará, Altar do Chão (Bernard 2001b); Pará, Area do Caraipe (Pine et al. 1996); Pernambuco, Fazenda Paus Grandes (Mares et al. 1981); Bahia, Lamarão (type locality of *Anthorhina picta* O. Thomas); Bahia, Ilhéus (Faria, Soares-Santos, and Sampaio 2006); Rio de Janeiro, Poço das Antas Biological Reserve (Baptista and Mello 2001); Minas Gerais, Três Marias (Mares, Braun, and Gettinger 1989); Minas Gerais, Panga Ecological Reserve (Pedro and Taddei 1997); Mato Grosso, Villa María (type locality of *Phyllostoma longifolium* J. A. Wagner). BOLIVIA: Santa Cruz, Los Fierros (Emmons 1998); Beni, mouth of Río Baures (Koopman 1976); Pando, San Miguel (Aguirre and Urioste 1994). PERU: Madre de Dios, Pakitza (Ascorra, Wilson, and Romo 1991); Huánuco, Río Pachitea (type locality of *Anthorhina peruana* O. Thomas); Loreto, Jenaro Herrera (Ascorra, Gorchov, and Cornejo 1994); Amazonas, Quebrada Kagka (J. L. Patton, Berlin, and Berlin 1982). ECUADOR (Albuja 1999): El Oro, Cayancas; Esmeraldas, Bilsa. COLOMBIA: Cauca, Tambito Nature Preserve (Dávalos and Guerrero 1999); Valle del Cauca, Hormiguero (M. E. Thomas 1972); Caldas, Finca Los Naranjos (Castaño et al. 2003); Antioquia, Barbosa (Muñoz 2001). VENEZUELA: Zulia, El Rosario, 39 km WNW of Encontrados (Handley 1976).



Map 151 Marginal localities for *Mimon crenulatum* •

SUBSPECIES: We recognize four subspecies of *M. crenulatum*.

M. c. crenulatum (É. Geoffroy St.-Hilaire, 1803)

SYNONYMS:

Phyllostoma crenulata É. Geoffroy St.-Hilaire, 1803:61; type locality unknown; given as Brazil by Schinz (1844) and further restricted to Baía (= Bahia) by Cabrera (1958:66).

Ph[yllostomus]. crenulatus: Olfers, 1818:224; name combination.

Tylostoma crenulatum: P. Gervais, 1856a:183; name combination.

[*Anthorhina*] *crenulatum*: Trouessart, 1905:112; name combination.

Mimon [*(Anthorhina)*] *crenulatum*: Cabrera, 1958:66; name combination.

The nominate subspecies occurs in eastern Venezuela, the island of Trinidad, and the Guianas south into the lower Amazon basin and along the Atlantic Coast of Brazil as far south as the state of Bahia.

M. c. keenani Handley, 1960

SYNONYM:

Mimon crenulatum keenani Handley, 1960:460; type locality "Fort Gulick, Panama Canal Zone," Panama.

This subspecies is distributed from Panama through Colombia into northwestern Venezuela and western Ecuador. Elsewhere, *M. c. keenani* is found in Central America and southern Mexico.

M. c. longifolium (J. A. Wagner, 1843)

SYNONYMS:

Phyllostoma longifolium J. A. Wagner, 1843a:365; type locality "Villa Maria," Mato Grosso, Brazil.

Phyllostoma [*(Tylostoma)*] *crenulatum*: W. Peters, 1865:514; name combination.

Tylostoma longifolium: W. Peters, 1866c:398; name combination.

Phyllostoma (Tylostoma) longifolium: Pelzeln, 1883:31; name combination.

A[*nthorhina*]. *longifolium*: O. Thomas, 1903f:458; name combination.

Anthorhina peruana O. Thomas, 1923e:693; type locality "Rio Pachitea," Huánuco, Peru.

Mimon peruanum: Cabrera, 1958:66; name combination.

Mimon crenulatum longifolium: Handley, 1966c:463; first use of current name combination.

This subspecies is in southern Colombia, eastern Ecuador, eastern Peru, western and central Brazil, and northern Bolivia.

M. c. picatum (O. Thomas, 1903)

SYNONYMS:

Anthorhina picata O. Thomas, 1903f:457; type locality "Lamarão, Bahia," Brazil.

Mimon picatum: Cabrera, 1958:66; name combination.

Mimon crenulatum picatum: Handley, 1966c:463; first use of current name combination.

This subspecies is known from the type locality in Bahia, south into the state of Rio de Janeiro.

NATURAL HISTORY: Hill (1965), Handley (1966c, 1976), Tuttle (1970), and Pine et al. (1996) associated *M. crenulatum* with forest habitats; the species also has been reported from agricultural areas (Handley 1966c, 1976; S. L. Williams and Genoways 1980a). This species roosts in buildings and hollow trees (Goodwin and Greenhall 1961; Handley 1966c, 1976). According to Gardner (1977c), the insectivorous feeding habits of *M. crenulatum* are based on the report by Dobson (1878). Pedro, Komeno, and Taddei (1994) found pollen and insect remains in feces from specimens caught in ground-level mistnets in the vicinity of Uberlândia, Minas Gerais, Brazil. Pine et al. (1996) reported specimens taken in ground level nets placed in tall terra firme forest in southeastern Pará State in Brazil. Mares, Braun, and Gettinger (1989) reported two females, each carrying a large fetus (CR = 30 and 35 mm, respectively) when taken in October in Minas Gerais, Brazil. Also, in Minas Gerais, Pedro, Komeno, and Taddei (1994) found a pregnant female (16.6-mm-CR fetus) in September, and another in October (29.2-mm-CR fetus). They interpreted these dates as indicating births at the beginning of the rainy season. Brennan and Reed (1975) listed three species of trombiculid mites recovered from Venezuelan *M. crenulatum*. Webb and Loomis (1977) listed one nycteribiid batfly, one myobiid mite, one spinturnicid mite, one trombiculid mite, and three argasid ticks known from this species. R. Guerrero (1985a) reported another spinturnicid mite and a streblid batfly. Komeno and Linhares (1999) added a nycteribiid batfly to the diverse ectoparasitic fauna known from this species.

The karyotype is $2n = 32$, FN = 60 (R. J. Baker and Hsu 1970). R. J. Baker, Gardner, and Patton (1972) reported a chromosomal polymorphism involving the fifth largest pair of autosomes.

REMARKS: Koopman (1993) dated *M. crenulatum* from É. Geoffroy St.-Hilaire (1810b) and not from É. Geoffroy St.-Hilaire's (1803) "Catalogue des mammifères," because the latter work was considered to be an unpublished proof (I. Geoffroy St.-Hilaire 1839:5 [footnote], 1847b:115–18; Sherborn 1922:lviii, 1932:cxxxviii; Wilson and Reeder 1993:831). A recent ruling (ICZN 2002) has confirmed that É. Geoffroy St.-Hilaire's (1803) *Catalogue des mammifères du Muséum National d'Histoire Naturelle* is available for nomenclatural purposes.

When Handley (1960) reviewed the systematics of *M. crenulatum*, he recognized four subspecies, all of which occurred in South America. Subsequently, Gardner and Patton (1972) described *M. koepckeae* based upon specimens from cloud forest habitat on the eastern slope of the Andes in departamento Ayacucho, Peru. Koopman (1976, 1978) treated *M. koepckeae* as "only a Peruvian highland subspecies of *M. crenulatum*." However, *M. koepckeae* is a valid species, as confirmed by several investigators (e.g., Simmons and Voss 1998).

Some authors placed *M. crenulatum* in the genus *Anthorhina*; however, Simpson (1945) considered *Anthorhina* and *Mimon* to be congeneric. Husson (1962, 1978) argued for the continued use of *Anthorhina*, whereas Cabrera (1958), Goodwin and Greenhall (1961), Hill (1965), Gardner and Patton (1972), and Corbet and Hill (1991) all used *Anthorhina* at the subgeneric level. Handley (1960) wrote "the nominal genera *Anthorhina* and *Mimon* are not distinguishable even as subgenera." Also, as pointed out by Gardner and Ferrell (1990), *Anthorhina* is a junior synonym of *Tonatia* Gray, 1827, and is not available for taxa now included in the genus *Mimon*. *Anthorhina* Lydekker in Flower and Lydekker (1891), because it is a replacement name for *Tylostoma* P. Gervais, 1856a (preoccupied), takes the same type species as was subsequently designated by Palmer (1904) for *Tylostoma* P. Gervais.

Cabrera's (1958) secondary restriction of the type locality to Bahia, Brazil, is unfortunate. The eastern and southeastern Brazilian populations probably should bear the name *M. c. picatum*, whereas the Guianan, Venezuelan, and adjacent Brazilian populations most likely should be known as the nominate subspecies. Cabrera (1958), when dealing with a species for which the origin of its type specimen was unknown, often followed the practice of designating as the type locality the first place where a specimen was subsequently collected. Schinz (1844) restricted the type locality of *Phyllostoma crenulatum* Geoffroy St. Hilaire to Brazil. Then Cabrera (1958) secondarily restricted the type locality to Bahia based on the first specimen recorded from Brazil. Sanborn (1949b), Handley (1960), Goodwin and Greenhall (1961), Hill (1965), Gardner and Patton (1972); Husson (1978), Genoways and Williams (1979b); Swanepoel and Genoways (1979), C. H. Carter et al. (1981), and Simmons and Voss (1998) have provided measurements of South American *M. crenulatum*. D. C. Carter and Dolan (1978) gave information on and measurements of the holotypes of *Phyllostoma crenulata* É. Geoffroy St.-Hilaire, *Anthorhina peruana* O. Thomas, and *Anthorhina picata* O. Thomas.

Mimon koepckeae Gardner and Patton, 1972

Koepcke's Spear-nosed Bat

SYNONYMS:

Mimon koepckeae Gardner and Patton, 1972:7; type locality "Huanhuachayo (12°44′S, 73° 47′W, elevation *ca.* 1,660 meters, Departamento de Ayacucho, Perú."

[*Mimon crenulatum*] *koepkeae*: Koopman, 1976:46; name combination and incorrect subsequent spelling of *Mimon koepckeae* Gardner and Patton.

DISTRIBUTION: *Mimon koepckeae* is known from the type locality and vicinity.

Marginal Localities (Map 150; from Gardner and Patton 1972): PERU: Ayacucho, Huanhuachayo (type locality of *Mimon koepckeae* Gardner and Patton); Ayacucho, Estera Ruana (not mapped).

SUBSPECIES: *Mimon koepckeae* is monotypic.

NATURAL HISTORY: Specimens were caught in ground-level mistnets placed in Andean slope forest adjacent to clearings (Huanhuachayo and Estera Ruana) along the trail from San José to Tambo.

REMARKS: Koopman (1976, 1978) treated *M. koepckeae* as "only a Peruvian highland subspecies of *M. crenulatum*." However, *M. koepckeae* can be distinguished by its pale color, lack of dorsal stripe, narrow auditory bullae, and by the vertical groove on the cingulum between the paracone and hypocone of the first and second upper molars. Gardner and Patton (1972, Table 3) gave measurements demonstrating the smaller size of *M. koepckeae* in comparison to Peruvian *M. crenulatum*. Although their sample of *M. koepckeae* was small (one female and two males) there was no overlap in measurements of greatest length of skull, condylobasal length, zygomatic breadth, palatal length, maxillary and mandibular toothrows, and breadth across upper molars.

Genus *Neonycteris* Sanborn, 1949

The monotypic *Neonycteris* is represented by *N. pusilla*, a small (forearm 34.3 mm, greatest length of skull 17.9 mm), dark brown phyllostomine with a brown venter. Distinguishing features include a rounded ear; the lack of an interauricular cutaneous band; lower border of narial horseshoe defined by a ridge; and lower lip with single pair of smooth tubercles separated in the midline by a shallow cleft. The metacarpal of digit IV is the shortest and the metacarpal of digit III is longest; the second phalanx of digit III is longer than the first, and the second phalanx of digit IV is about equal in length to the first phalanx. The calcar is shorter than the foot. Canines are relatively short, less than twice as high as the upper inner incisors. The occlusal surfaces of the upper outer incisors are visible in the toothrow, and not hidden under the cingula of the canines. The lower incisors are trifid. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Neonycteris Sanborn 1949a:226; type species *Micronycteris (Neonycteris) pusilla* Sanborn, 1949a, by monotypy; described as a subgenus of *Micronycteris* Gray.

Neonycteris: Simmons and Voss, 1998:62; first use as a full genus.

Neonycteris pusilla (Sanborn, 1949)

Least Big-eared Bat

SYNONYMS:

Micronycteris (Neonycteris) pusilla Sanborn, 1949a:228; type locality "Tahuapunta, Rio Vaupes, at the Colombian border, Amazonas, Brazil."

[*Neonycteris*] *pusilla*: Simmons and Voss, 1998:62; first use of current name combination.

DISTRIBUTION: *Neonycteris pusilla* is known only from the type locality in northwestern Brazil.

MARGINAL LOCALITY (Map 146): BRAZIL: Amazonas, Tahuapunta, Rio Vaupés (type locality of *Micronycteris (Neonycteris) pusilla* Sanborn).

SUBSPECIES: *Neonycteris pusilla* is monotypic.

NATURAL HISTORY: Unknown.

REMARKS: *Neonycteris pusilla* is known on the basis of two males collected at the type locality. Sanborn (1949a), Swanepoel and Genoways (1979), and Simmons and Voss (1998) have provided measurements of these two specimens.

Genus *Phylloderma* W. Peters, 1865

The monotypic *Phylloderma* is represented by *P. stenops*, a medium-sized bat (forearm 65–74 mm, greatest length of skull 30–33 mm) morphologically similar to *Phyllostomus* spp. *Phylloderma* can be distinguished by the obviously expanded braincase, bifid first lower incisor, three lower premolars (third premolar small), and narrow-crowned molars. The calcar is about equal to or shorter than the foot, and the tail extends to mid-length of the interfemoral membrane. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Phylloderma W. Peters, 1865c:513; type species *Phylloderma stenops* W. Peters, 1865c, by monotypy.

Guandira Gray, 1866b:114; type species *Guandira cayanensis* Gray, 1866b, by monotypy.

Phyllostomus: R. J. Baker, Dunn, and Nelson, 1988:13; part; not *Phyllostomus* Lacépède, 1899.

Guyira Muñoz, 2001, 71; incorrect subsequent spelling of *Guandira* Gray.

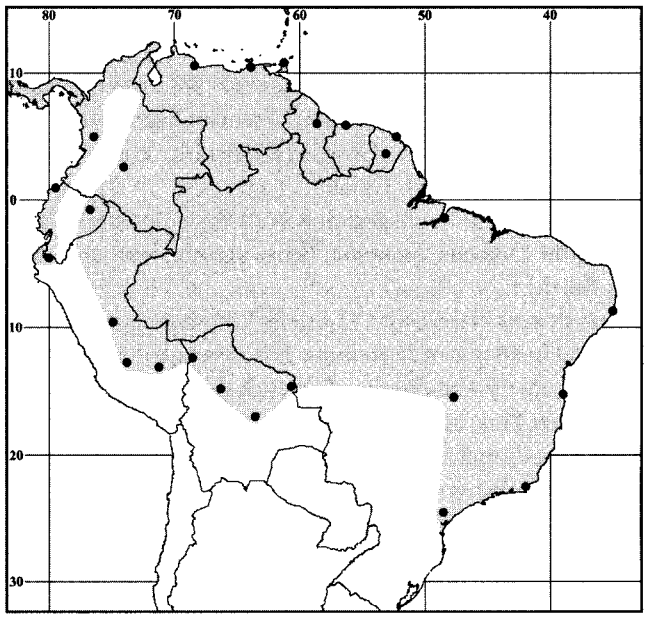
Phylloderma stenops W. Peters, 1865

Spear-nosed Bat

SYNONYMS: See under Subspecies.

DISTRIBUTION: *Phylloderma stenops* occurs in Colombia, Venezuela, the Guianas, Ecuador, Peru, Brazil, and Bolivia. The species also occurs in Mexico and Central America.

MARGINAL LOCALITIES (Map 152): VENEZUELA (Handley 1976): Falcón 19 km NW of Urama; Sucre, 21 km E of Cumaná. TRINIDAD AND TOBAGO: Trinidad, Blanchisseuse (C. H. Carter et al. 1981). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Coronie, Totness (Genoways and Williams 1979b). FRENCH GUIANA: Cayenne (type locality of *Phylloderma stenops* W. Peters, and *Guandira cayanensis* Gray); Les Eaux Claires (Simmons, Voss, and Peckham 2000). BRAZIL: Pará, Utinga (Handley 1967); Pernambuco, Estação Florestal de Experimentação de Saltinho (Guerra 1981b); Bahia, Reserva Biológica de Una (Esbérard and Faria 2006); Rio de Janeiro, Fazenda Reunidas (Esbérard and Faria 2006); São Paulo, Iporanga (Trajano 1982); Distrito Federal, Gruta Água Rasa (Bredt, Uieda, and Magalhães 1999). BOLIVIA (S. Anderson 1997, except as noted): Santa Cruz, 23 km S of Campamento Los Fierros; Santa Cruz, 7 km N of Santa Rosa (type locality of *Phylloderma septentrionalis boliviensis* Barquez and Ojeda); Beni, Totaisal; Pando, Chivé. PERU: Cusco, Consuelo (V. Pacheco et al. 1993); Ayacucho, Yuraccyacu (Gardner 1976); Huánuco, Panguana (Hutterer et al. 1995). ECUADOR: Orellana, 30 km SW of Onkone Gare (F. A. Reid, Engstrom, and Lim 2000). COLOMBIA: Meta, Cabaña Duda (Lemke et al. 1982); Chocó, 4 km N of La Italia (Alberico 1994). ECUADOR: Esmeraldas, El Porvenir (Albuja and Mena 2004). PERU: Piura, 4 miles W of Suyo (TCWC 16412).



Map 152 Marginal localities for *Phylloderma stenops* ●

SUBSPECIES: We recognize three subspecies of *P. stenops*, two of which occur in South America. *Phylloderma stenops septentrionalis* Goodwin, 1940, is found in Central America.

P. s. boliviensis Barquez and Ojeda, 1979

SYNONYMS:

Phylloderma stenops boliviensis Barquez and Ojeda, 1979:84; type locality "7 km al norte de Santa Rosa, Provincia de Sara, Departamento Santa Cruz," Bolivia.

Phyllostomus stenops boliviensis: S. Anderson, 1997:202; name combination.

This subspecies is known only from southeastern Bolivia.

P. s. stenops W. Peters, 1865

SYNONYMS:

Ph[yllostoma (Phylloderma)]. stenops W. Peters, 1865c: 513; type locality "Cayenne," French Guiana.

Guandira cayanensis Gray, 1866b:114; type locality "Cayenne," French Guiana.

The nominate subspecies occurs in Colombia, Venezuela, the Guianas, Ecuador, Peru, and northern and eastern Brazil.

NATURAL HISTORY: Little is known about the ecology and behavior of *P. stenops*. It is associated with a variety of primary and disturbed forest habitats (Hill 1965; D. C. Carter, Pine, and Davis 1966; Handley 1966c, 1976; S. L. Williams and Genoways 1980a). Gardner (1977c) suggested that this species feeds on insects and plant material. However, the only reference to food habits is of one individual feeding on the larvae and pupae from the nest of a social wasp (Jeanne 1970). Brennan and Reed (1975) listed a trombiculid mite, Webb and Loomis (1977) listed a streblid batfly, and R. Guerrero (1985a) added two genera of batflies and four species of mites, representing three genera, as ectoparasites known from *P stenops*. R. Guerrero (1997) listed six streblid batflies, five of which had not been reported by either Webb and Loomis (1977) or R. Guerrero (1985a). The karyotype is $2n = 32$, FN = 58 (R. J. Baker et al. 1982).

REMARKS: Handley (1966c) stated that specimens from Panama combined the characteristics of the two nominal species of *Phylloderma* (*P. stenops* and *P. septentrionalis*); therefore, he synonymized them under the name *P. stenops*. Goodwin and Greenhall (1961), Husson (1962), Hill (1965), Gardner (1976), Ojeda and Barquez (1978), Barquez and Ojeda (1979), Genoways and Williams (1979b), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), C. H. Carter et al. (1981), and Barquez (1984a) have provided measurements of South American specimens. D. C. Carter and Dolan (1978) gave information on and measurements of the holotypes of *Phylloderma stenops* W. Peters and *Guandira cayanensis* Gray.

Genus *Phyllostomus* Lacépède, 1799

The genus *Phyllostomus* is represented by four species of medium-sized to large bats (forearm 58–88 mm, greatest length of skull 28–39 mm). These bats can be distinguished from other phyllostomines by the presence of two incisors and two premolars in the lower toothrow. The tail extends to the middle of the interfemoral membrane. The length of the calcar, as compared to the length of the foot, varies between species. A gular gland, well developed in males but rudimentary in females, is present in all species. The dental formula is 2/2, 1/1, 2/2, 3/3 × 2 = 32.

SYNONYMS:

Vespertilio: Pallas, 1767:7; part; not *Vespertilio* Linnaeus, 1758.

Pteropus: Erxleben, 1777:136; not *Pteropus* Brisson, 1762.

Phyllostomus Lacépède, 1799b:16; type species *Vespertilio hastatus* Pallas, 1767, by monotypy; later ruled (ICZN 1955:Direction 24) to be by subsequent selection by Miller and Rehn (1901).

Phyllostoma G. Cuvier, 1800:Tab. I; unjustified emendation of *Phyllostomus* Lacépède, 1799b; placed on Official List of Rejected and Invalid Names (ICZN 1955).

Phylostoma G. Fischer, 1817:373; incorrect subsequent spelling of *Phyllostoma* G. Cuvier.

Alectops Gray, 1866b:114; type species *Alectops ater* Gray, 1866b, by monotypy.

Phyllostomum Thenius, 1969:257; incorrect subsequent spelling of *Phyllostomus* Lacépède.

KEY TO SPECIES OF *PHYLLOSTOMUS*:

1. Length of calcar equal to or longer than length of hind foot; length of ear (from notch) more than 25 mm; sagittal crest well developed; first upper and first lower incisors higher (longer) than wide 2
1′. Length of calcar shorter than length of hind foot; length of ear (from notch) less than 25 mm; sagittal crest absent or weakly developed; first upper and lower incisors broad (wider than high) . . . . . *Phyllostomus discolor*
2. Forearm shorter than 75 mm; wing membrane attached to ankles; greatest length of skull less than 35 mm . . . 3
2′. Forearm longer than 75 mm; wing membrane attached to side of foot; greatest length of skull more than 35 mm . . . . . *Phyllostomus hastatus*
3. Forearm longer than 61 mm; tibia longer than 23 mm; greatest length of skull more than 29 mm . . . . . *Phyllostomus elongatus*
3′. Forearm shorter than 61 mm; tibia shorter than 24 mm; greatest length of skull less than 29 mm . . . . . *Phyllostomus latifolius*

Phyllostomus discolor (J. A. Wagner, 1843)

Pale Spear-nosed Bat

SYNONYMS:

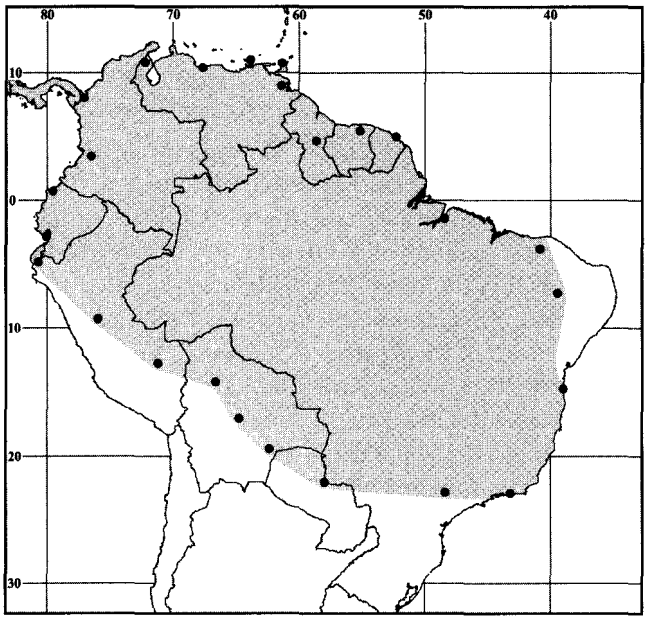
Phyllostoma discolor J. A. Wagner, 1843a:366; type locality "Cuyaba," Mato Grosso, Brazil.

Ph[yllostoma]. innominatum Tschudi, 1844b:62; type locality "Maynas" [p. 68], Loreto, Peru.

Phyllostoma angusticeps P. Gervais, 1856a:47; type locality "province de Bahia," Brazil.

Phyllostoma verrucossum Elliot, 1905a:236; type locality "Niltepec, Oaxaca, Mexico."

P[hyllostomus]. verrucosus: Miller, 1907b:131; name combination and emendation of *Phyllostoma verrucossum* Elliot.



Map 153 Marginal localities for *Phyllostomus discolor* •

Phyllostomus discolor: J. A. Allen, 1904d:344; first use of current name combination.

DISTRIBUTION: *Phyllostomus discolor* is in Colombia, Venezuela, the Guianas, Ecuador, Peru, Brazil, Bolivia, Paraguay, and possibly northern Argentina. The species also occurs in Mexico and Central America.

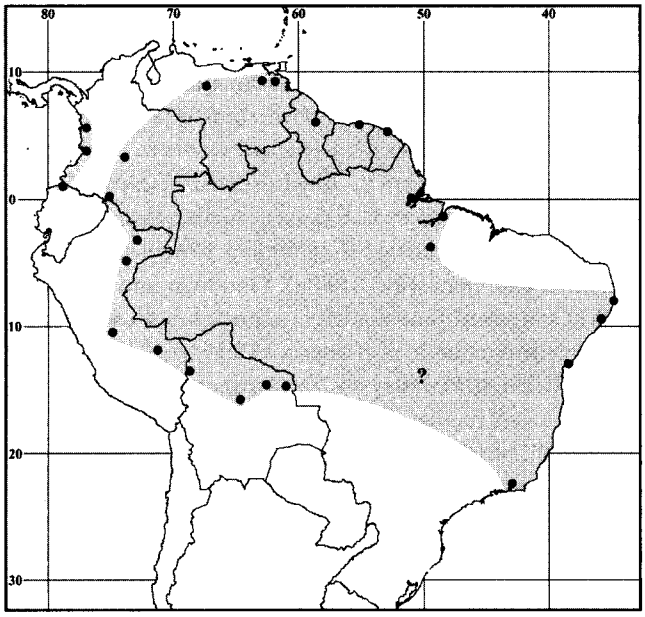
MARGINAL LOCALITIES (Map 153): VENEZUELA: Nueva Esparta, Margarita Island, El Valle (J. D. Smith and Genoways 1974). TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). VENEZUELA: Delta Amacuro, Caño Araguaito (Linares and Rivas 2004). GUYANA: Potaro-Siparuni, Kurupukari (P. G. Smith and Kerry 1996). SURINAM: Para, Zanderij (Genoways, Williams, and Groen 1981). FRENCH GUIANA: Cayenne (Sanborn 1936). BRAZIL: Pará, Belém (Carvalho 1960a); Ceará, Horto (S. S. P. Silva, Guedes, and Peracchi 2001); Ceará, Aeroporto de Crato (Mares et al. 1981); Bahia Ilhéus (Faria. Soares-Santos, and Sampaio 2006); Rio de Janeiro, Reserva Florestal do Grajaú (Esbérard 2003); São Paulo, Botucatu region (Uieda and Chaves 2005). PARAGUAY: Alto Paraguay, Puerto Sastre (Myers and Wetzel 1983). BOLIVIA: Santa Cruz, Hacienda Cerro Colorado (Ibáñez and Ochoa 1989); Cochabamba, Sajta (S. Anderson 1997); Beni, Espíritu (S. Anderson 1997). PERU: Madre de Dios, Itahuana (Koopman 1978); Huánuco, Tingo María (Gardner 1976); Piura, Salitral (Koopman 1978). ECUADOR: Guayas, Isla Puná (Power and Tamsitt 1973); Esmeraldas, 3 km W of Majua (USNM 513434). COLOMBIA: Valle del Cauca, Cali (Power and Tamsitt 1973); Chocó, Unguía (Cuartas and Muñoz 1999). VENEZUELA: Zulia, near Cerro Azul, 33 km NW of La Paz (Handley 1976); Aragua, Portachuelo (USNM 562892).

SUBSPECIES: We recognize two subspecies of *P. discolor*; the nominate form, *P. d. discolor* (J. A. Wagner), is the only South American subspecies.

NATURAL HISTORY: *Phyllostomus discolor* is associated with a variety of habitats ranging from primary forest to agricultural areas (Handley 1966c, 1976; S. L. Williams and Genoways 1980a). Goodwin and Greenhall (1961) suggested that this species prefers hollow trees for roosting sites, but it also roosts in caves (Greenhall and Paradiso 1968; Handley 1976; Gardner 1977a). Gardner (1977c) cited references documenting an omnivorous diet of insects and a variety of plant material, including fruit, pollen, nectar, and other flower parts. Goodwin and Greenhall (1961) and Valdez (1970) commented that this species has an extensible and grooved tongue that could facilitate feeding on pollen and nectar. In their summary of endoparasites, Ubelaker, Specian, and Duszynski (1977) mentioned trypanosomes and nematodes as occurring in *P. discolor*. Brennan and Reed (1975) listed six trombiculid mites, and Webb and Loomis (1977) added eight streblid batflies, one myobiid mite, one labidocarpid mite, and two spinturnicid mites as ectoparasites. R. Guerrero (1985a) added one endoparasite (a nematode) and ten ectoparasites (one trombiculid mite, three spinturnicid mites, and six streblid batflies). R. Guerrero (1997) listed 18 species of streblids known from *P. discolor*. Cuartas and Muñoz (1999) found trichostrongylid nematodes in the small intestine of Colombian specimens. The karyotype is $2n = 32$, FN = 60 (R. J. Baker et al. 1982).

REMARKS: Based on the results of a multivariate morphometric analysis, Power and Tamsitt (1973) did not recognize subspecies within *P. discolor*. Although they delineated morphological differences between populations living west of the Andes in South America and into Central America, from those living east of the Andes, these differences were not unambiguous. W. B. Davis and Carter (1962a) also questioned the use of subspecies in *P. discolor*, stating "that measurements hitherto considered as expressions of geographic variation are in reality expressions of individual variation." However, recent authors have not treated *P. discolor* as monotypic. A comprehensive revision, combining data from molecular genetics, has yet to be done.

Taddei (1975) found that Brazilian specimens of *P. discolor* had coefficients of variation for external measurements of from 2.38 to 6.51, and for cranial dimensions, from 0.96 to 4.45. Power and Tamsitt (1973) and Taddei (1975) documented secondary sexual variation in this species; differences that primarily involved breadth measurements of the skull. Other authors recording measurements of *P. discolor* include Sanborn (1936), Dalquest



Map 154 Marginal localities for *Phyllostomus elongatus* •

(1951), Goodwin and Greenhall (1961), W. B. Davis and Carter (1962a), Tamsitt and Valdivieso (1963a), Gardner (1976), J. D. Smith and Genoways (1974), Husson (1978), and Swanepoel and Genoways (1979). D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Phyllostoma discolor* J. A. Wagner.

Phyllostomus elongatus (É. Geoffroy St.-Hilaire, 1810)
Lesser Spear-nosed Bat

SYNONYMS:

Phyllostoma elongatum É. Geoffroy St.-Hilaire, 1810b: 182; type locality "en Amérique" (p. 185); restricted to Brazil by Schinz (1844:325); further restricted to Rio Branco, Mato Grosso, Brazil, by Cabrera (1958), the origin of Natterer's specimen cited by Pelzeln (1883: 31).

Ph[*yllostomus*]. *elongatus*: Olfers, 1818:224; first use of current name combination.

Alectops ater Gray, 1866b:114; type locality "Surinam."

Phyllostoma lanceolatum Pelzeln, 1883:31; in synonymy, *nomen nudum*.

Phyllostomus elongatum: C. O. C. Vieira, 1942:281; incorrect subsequent spelling of *Phyllostomus elongatus*.

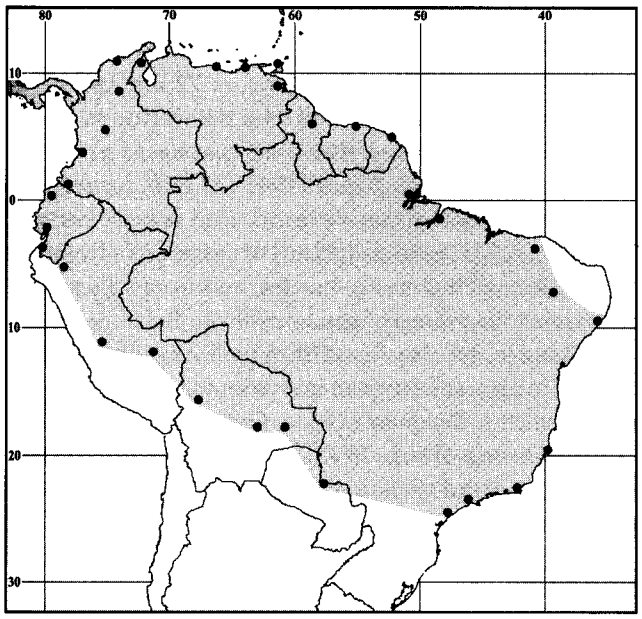
P[*hyllostomus*]. *ater*: Muñoz, 2001:76; name combination.

DISTRIBUTION: *Phyllostomus elongatus* occurs in Colombia, Venezuela, the Guianas, Peru, Bolivia, and Brazil, with an isolated population unit in western Colombia and northwestern Ecuador.

MARGINAL LOCALITIES (Map 154): *Primary distribution.* VENEZUELA: Monagas, Hato Mata de Bejuco (Handley 1976); Delta Amacuro, Los Güires (Ojasti and Naranjo 1974). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Paramaribo, Paramaribo (Husson 1978). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL (C. O. C. Vieira 1955, except as noted): Amapá, Marcapá (Mok and Lacey 1980); Pará, Utinga (Handley 1967); Pará, Area do Caraipe (Pine et al. 1996); Pernambuco, Recife (Souza-Lopes 1978); Alagoas, Rio Largo; Bahia, Salvador; Rio de Janeiro, Terezopolis. BOLIVIA: Santa Cruz, El Refugio (Emmons 1998); Santa Cruz, Perseverencia (S. Anderson 1997); Beni, 5 km NW of mouth of Río Grande (S. Anderson, Koopman, and Creighton 1982); La Paz, Alto Río Madidi (Emmons 1991). PERU: Madre de Dios, Pakitza (Ascorra, Wilson, and Romo 1991); Pasco, San Juan (Tuttle 1970); Loreto, Jenaro Herrera (Ascorra, Gorchov, and Cornejo 1994); Loreto, Quebrada Sucusari (Ascorra and Wilson 1992). COLOMBIA: Putumayo, Parque Nacional Natural La Paya (Polanco-Ochoa, Jaimes, and Piragua 2000); Meta, Los Micos (Furman 1966). VENEZUELA: Guarico, Estación Biológica de los Llanos (Handley 1976). *Northwestern distribution.* COLOMBIA: Chocó, near Rio Patio, approximately 15 km S and 30 km W of Quibdó (Alberico 1994); Valle del Cauca, Zabaletas (M. E. Thomas 1972). ECUADOR: Esmeraldas, Urbina (Albuja 1983).

SUBSPECIES: We are treating *P. elongatus* as monotypic; the species needs to be revised.

NATURAL HISTORY: *Phyllostomus elongatus* is associated with forest habitats (Hill 1965, Tuttle 1970, Handley 1976; S. L. Williams and Genoways 1980a; Pine et al. 1996), and agricultural areas (Handley 1976). Tuttle (1970) and Handley (1976) reported this species roosting in hollow trees and culverts. Gardner (1977c), while commenting that nothing was known about its food habits, suggested that the diet includes "flower parts, fruits, insects, and small vertebrates." His suggestion was based on documentation concerning the food habits of *P. discolor* and *P. hastatus*, and on Tuttle's (1970) report of finding pollen on Peruvian *P. elongatus*. *Phyllostomus elongatus* occasionally is carnivorous; E. Fischer et al. (1997) reported watching a *P. elongatus* eating a juvenile *Carollia perspicillata* in Maruaga Cave, Presidente Figueiredo, Amazonas, Brazil. Trypanosomes were listed by Ubelaker, Specian, and Duszynski (1977) as endoparasites reported from this species. Brennan and Reed (1975) identified a trombiculid mite recovered from Venezuelan specimens. Webb and Loomis (1977) listed two streblid batflies, one spinturnicid mite, and two labidocarpid mites as ectoparasites. According to R. Guerrero (1985a), *P. elongatus* is host to an additional species of labidocarpid mite, two more spinturnicid mites, and nine streblid batflies. R. Guerrero (1997) listed 14 streblids confirmed from *P. elongatus*. The karyotype is $2n = 32$, FN = 58 (R. J. Baker et al. 1982).



Map 155 Marginal localities for *Phyllostomus hastatus* •

REMARKS: Husson (1962) found little variation in measurements among the samples he examined from Surinam and Guyana, and the measurements of Peruvian specimens reported by Sanborn (1951b). Sanborn (1936), Butterworth and Starrett (1964), Hill (1965), Husson (1978), Swanepoel and Genoways (1979), and Simmons and Voss (1998) have provided measurements of *P. elongatus*. D. C. Carter and Dolan (1978) gave information on and measurements of the type of *Phyllostoma elongatum* É. Geoffroy St.-Hilaire.

Phyllostomus hastatus (Pallas, 1767)

Great Spear-nosed Bat

SYNONYMS: See under Subspecies.

DISTRIBUTION: *Phyllostomus hastatus* occurs in Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, Ecuador, Brazil, Peru, Bolivia, and Paraguay.

MARGINAL LOCALITIES (Map 155): COLOMBIA: Magdalena, Río Frio (USNM 240093). VENEZUELA: Zulia, near Cerro Azul, 33 km NW of La Paz (Handley 1976); Miranda, Birongo (Handley 1976); Sucre, 21 km E of Cumaná (Handley 1976); Delta Amacuro, Caño Araguaito (Linares and Rivas 2004). TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Paramaribo, Paramaribo (Husson 1978). FRENCH GUIANA: vicinity of Cayenne (Brosset and Dubost 1968). BRAZIL: Amapá, São Joaquim do Pacuí (Peracchi, Raimundo, and Tannure 1984); Pará, Belém (Carvalho 1960a); Ceará, Gruta do Tião (S. S. P. Silva, Guedes, and Peracchi 2001); Ceará, Colegio Agrícola de Crato (Mares et al. 1981); Alagoas, Rio Largo (J. L. Lima 1926); Espírito Santo, Rio Dôce (J. L. Lima 1926); Rio de Janeiro, Poço das Antas Biological Reserve (Baptista and Mello 2001); São Paulo, Mogi das Cruzes (C. O. C. Vieira 1955); São Paulo, Registro (McNab 1969). PARAGUAY: Concepción, Entre Estancia Estrellas et Estancia Primavera (Baud 1981). BOLIVIA: Santa Cruz, San José de Chiquitos (Barquez 1984a); Santa Cruz, Santa Cruz de la Sierra (S. Anderson et al. 1993); La Paz, 4 km (by road) NW of Alcoche (S. Anderson, Koopman, and Creighton 1982). PERU: Madre de Dios, Pakitza (Ascorra, Wilson, and Romo 1991); Junín, San Ramón (Koopman 1978); Amazonas, Pomará (Koopman 1978); Tumbes, Matapalo (Koopman 1978). ECUADOR: Guayas, Guayaquil (Albuja 1983); Esmeraldas, Quinindé (Albuja 1999). COLOMBIA: Nariño, Altaquer (Cadena, Anderson, and Rivas-Pava 1998); Valle del Cauca, Zabaletas (M. E. Thomas 1972); Caldas, Charca de Guarinocito (Castaño et al. 2003); Bolívar, Norosí (Hershkovitz 1949c).

SUBSPECIES: We recognize three subspecies of *P. hastatus*.

P. h. aruma O. Thomas, 1924

SYNONYM:

Phyllostomus hastatus aruma O. Thomas, 1924a:236; type locality "Taguatinga," Tocantins, Brazil.

This subspecies is known only from the type locality (see Taddei 1975).

P. h. hastatus (Pallas, 1767)

SYNONYMS:

V[espertilio]. hastatus Pallas, 1767:7; type locality "Amérique," restricted to Surinam by J. A. Allen (1904b: 233); based on *La chauvesouris fer-de-lance* of Buffon (1765).

[*Pteropus*] *hastatus*: Erxleben, 1777:136; name combination.

Phyllostomus hastatus: Lacépède, 1799b:16; first use of current name combination.

Phyllostoma emarginata É. Geoffroy St.-Hilaire, 1803:60; type locality "La Guiane."

Phyllostoma hastatum: É. Geoffroy St.-Hilaire, 1810b:177; name combination.

Phyllostomus maximus Wied-Neuwied, 1821:242, footnote; type locality "Die Wäldern an den Ufern des Rio das Contas," Bahia, Brazil.

Phyllostomus hastatus curaca Cabrera, 1917:12; type locality "Archidona, sobre el río Napo," Napo, Ecuador.

The nominate subspecies occurs throughout most of South America east of Lake Maracaibo and south of Cordillera de Mérida (Venezuela) to Bolivia, Paraguay, and southeastern Brazil.

P. h. panamensis J. A. Allen, 1904

SYNONYMS:

Phyllostomus hastatus panamensis J. A. Allen, 1904b:233; type locality "Boqueron, Chiriqui," Panama.

Phyllostomus hastatus caurae J. A. Allen, 1904b:234; type locality "Cali, upper Cauca Valley," Valle del Cauca, Colombia; incorrect original spelling of *Phyllostomus hastatus caucae* J. A. Allen.

Phyllostomus hastatus caucae: J. A. Allen, 1916c:225; corrected spelling of *Phyllostomus hastatus caurae* J. A. Allen.

Phyllostomus hastatus paeze O. Thomas, 1924a:235; type locality "Bogota," Cundinamarca, Colombia.

This subspecies occurs in Colombia west of the Andes and north and west of Lake Maracaibo, Venezuela. Elsewhere, it is found in Central America (J. K. Jones and Carter 1976).

NATURAL HISTORY: *Phyllostomus hastatus* is a widespread species that appears to occupy the full range of habitats within its distribution. Documented roosting sites include caves, hollow trees, foliage, buildings, hollow termite nests, and thatched roofs (Goodwin and Greenhall 1961; Handley 1966c, 1976; Tuttle 1970; McCarthy, Cadena, and Lemke 1983). Gardner (1977c) documented a diet of fruits, flower parts, nectar, pollen, and a variety of insects and small vertebrates. Kalko and Condon (1998) considered *P. hastatus* the primary dispersal agent of the seeds of *Gurania spinulosa* (Cucurbitaceae), a neotropical vine with flagellichorous fruits. In their summary of endoparasites found in leaf-nosed bats, Ubelaker, Specian, and Duszynski (1977) noted that trypanosomes, cestodes, nematodes, and trematodes have been recorded from *P. hastatus*. Brennan and Reed (1975) identified four trombiculid mites from Venezuelan *P.* hastatus. Webb and Loomis (1977) listed 15 species of streblid batflies, 1 ereynetid mite, 1 demodicid mite, 1 labidocarpid mite, 2 spinturnicid mites, 5 trombiculid mites, and 2 argasid ticks as known ectoparasites found on this species. R. Guerrero (1985a) added three trypanosomes, two intestinal nematodes, a flea, two macronyssid mites, four spinturnicid mites, and eight streblid batflies to the parasites known from *P. hastatus*. R. Guerrero (1997) listed 26 species of streblids confirmed from this species. Santos et al. (2003) summarized natural history information in their *Mammalian Species* account. The karyotype is $2n = 32$, FN = 58 (R. J. Baker et al. 1982).

REMARKS: Although *P. hastatus* is a widespread and, in some areas, relatively common, little has been written about its geographic variation. Hershkovitz (1949c) made brief comments on a comparison of Venezuelan specimens of *P. h. hastatus* with Colombian and Panamanian representatives of *P. h. panamensis*, and in which *P. h. panamensis* averaged larger. Taddei (1975) found that the type of *P. h. aruma* was smaller than the other Brazilian specimens he identified as *P. h. hastatus* (forearm 72 mm versus 78–88 mm, greatest length of skull 34.0 mm versus 36.0–38.8 mm). He also remarked that other specimens previously identified by C. O. C. Vieira (1942) as *P. h. aruma* were misidentified because they were too small to be *P. hastatus*.

Taddei (1975) gave coefficients of variation of from 1.28 to 6.04 for external measurements, and from 1.06 to 2.84 for cranial dimensions of specimens from Brazil. Using this same sample, he also found that males were larger than females in all cranial measurements and in 8 of 17 external measurements. Dalquest (1951), Goodwin and Greenhall (1961), Husson (1962, 1978), Swanepoel and Genoways (1979), Barquez (1984a), and Simmons and Voss (1998) have provided measurements of *P. hastatus*.

Phyllostomus latifolius (O. Thomas, 1901)

Guianan Spear-nosed Bat

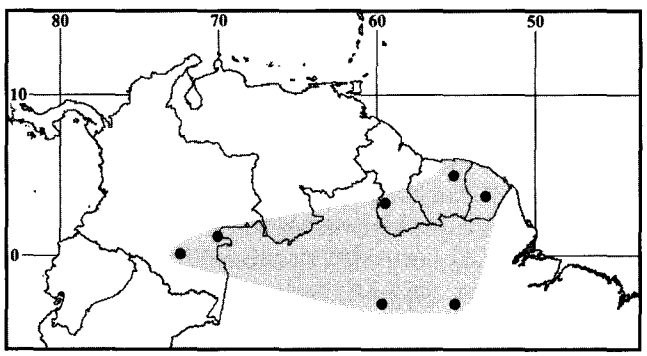
SYNONYMS:

Phyllostoma latifolium O. Thomas, 1901g:142; type locality "Kanuku Mountains," Upper Takutu-Upper Essequibo, Guyana.

P[*hyllostomus*]. *latifolius*: Miller, 1907b:131; first use of current name combination.

DISTRIBUTION: *Phyllostomus latifolius* is endemic to South America where it is known from southeastern Colombia, southern Guyana, northern Surinam, French Guiana, and north central Brazil. There is one dubious record from the Pacific Coast of Colombia (see Remarks).

MARGINAL LOCALITIES (Map 156): SURINAM: Brokopondo, 8 km S and 2 km W of Brownsweg (S. L. Williams and Genoways 1980a). FRENCH GUIANA: Les Eaux Claires (Simmons, Voss, and Peckham 2000). BRAZIL: Pará, Tauary (FMNH 42736); Amazonas, 5 km SE of Presidente Figueiredo (Sampaio et al. 2003). COLOMBIA: Caquetá, Estación Puerto Abeja (Montenegro and Romero-Ruiz 2000); Vaupés, Mitú (Marinkelle and



Map 156 Marginal localities for *Phyllostomus latifolius* •

Cadena 1972). GUYANA: Upper Takutu-Upper Essequibo, Kanuku Mountains (type locality of *Phyllostoma latifolium* O. Thomas).

SUBSPECIES: We regard *P. latifolius* as monotypic.

NATURAL HISTORY: Little is known about the biology of *P. latifolius*. S. L. Williams and Genoways (1980a) collected several in mature tropical forests in Surinam. Marinkelle and Cadena (1972) reported specimens from small caves along the banks of a river in Colombia. A female from 5 km SE of Presidente Figueiredo, Amazonas, Brazil contained a 10-mm-CR embryo when taken on 20 November; the testes of a male taken on the same date measured 4 by 3 mm. Montenegro and Romero-Ruiz (2000) took one specimen in seasonally flooded forest, and eight in *terra firme* forest habitat in southern Colombia. Brosset and Charles-Dominique (1991) reported finding approximately 50 *P. latifolius* mixed in a tight cluster with an estimated 300 *Lonchorhina inusitata* over a pool in a cave in French Guiana. Based on the food habits of other species of *Phyllostomus*, Gardner (1977c) suggested that *P. latifolius* feeds on "flower parts, fruits, insects, and small vertebrates." R. Guerrero (1997) listed one species of streblid batfly known to parasitize *P. latifolius*. The karyotype is $2n = 32$, FN = 58 (Honeycutt, Baker, and Genoways 1980; R. J. Baker et al. 1982).

REMARKS: Oldfield Thomas (1901g) had eight specimens from the type locality when he described *P. latifolius*. He distinguished it from *P. elongatus* primarily on smaller size in addition to certain qualitative features, which Valdez (1970) claimed are unreliable when assessed against non-Guyanan populations. The record for *P. latifolius* from Río Zabaletas, Valle del Cauca, Colombia, listed by Muñoz (2001), is suspect. That record probably represents the material from the Pacific region cited in Alberico et al. (2000) and, if correctly identified, is the only record of the species west of the Andes. Measurement of *P. latifolius* have been provided by O. Thomas (1901g), Husson (1962), Marinkelle and Cadena (1972), Swanepoel and Genoways (1979), S. L. Williams and Genoways (1980a), and Simmons and Voss (1998). D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Phyllostoma latifolium* O. Thomas.

Genus *Tonatia* Gray, 1827

In South America, *Tonatia* is represented by two species of medium-sized, round-eared bats (forearm 51–62 mm, greatest length of skull 26–31 mm). The head, including the muzzle, is conspicuously furred. *Tonatia* is readily separated from other phyllostomines (except *Lophostoma* spp.) by the combination of a lower toothrow having only one incisor and three premolars, and by the presence of a tail that extends to the middle of the interfemoral membrane. Two features useful for distinguishing the two species of *Tonatia* from similar-sized species of *Lophostoma* with which they can be confused, are the relatively well-furred face and the comparatively broad postorbital constriction (wider than 5 mm and exceeding 90% of breadth across cingula of the canines, versus narrower than 5 mm and less than 90% of breadth across cingula of canines in *Lophostoma* spp.). As in *Chrotopterus* and *Lophostoma*, the calcar is longer than the foot. The dental formula is 2/1, 1/1, 2/3, 3/3 × 2 = 32 (also in *Chrotopterus* and *Lophostoma*).

SYNONYMS:

Tonatia Gray, 1827:71, in Griffith, Hamilton-Smith, and Pidgeon, 1827; type species *Vampyrus bidens* Spix, 1823, by monotypy.

Tylostoma P. Gervais, 1856a:49; type species *Phyllostoma bidens* (Spix, 1823), by subsequent designation (Palmer 1904:698); preoccupied by *Tylostoma* Sharpe, 1849 (Mollusca).

Anthorhina Lydekker, 1891:674, in Flower and Lydekker, 1891; replacement name for *Tylostoma* P. Gervais.

Anthorina Palmer, 1904:108; incorrect subsequent spelling of *Anthorhina* Lydekker in Flower and Lydekker.

REMARKS: Goodwin (1942b) reviewed the genus *Tonatia* (*sensu lato*) and, more recently, Genoways and Williams (1984) reviewed South American species (also *sensu lato*). In the most recent review, Lee, Hoofer, and Van Den Bussche (2002) transferred all of the species previously included in *Tonatia*, except *T. bidens* and *T. saurophila*, to the genus *Lophostoma*.

Gardner and Ferrell (1990) pointed out that several authors have placed *Mimon crenulatum* within *Anthorhina*, either at the generic level (Miller 1907b; Husson 1962, 1978) or the subgeneric level (Cabrera 1958, Goodwin and Greenhall 1961, Hill 1965, and Gardner and Patton 1972). These authors were unaware that *Anthorhina*, as a replacement name for *Tylostoma*, is a junior synonym of *Tonatia* Gray with the same type species (Palmer 1904); therefore, *Anthorhina* is not available for the taxa now included in the genus *Mimon*. As ICZN (1999) Article 67.8 makes clear, a name proposed to replace a previously established genus-group name has the same type species as the name replaced.

KEY TO SOUTH AMERICAN SPECIES OF *TONATIA*:

1. Postorbital constriction usually 5.0–5.5 mm (may approach 5.9 mm in northern Colombian populations); secondary process on mastoid partially obscuring base of mastoid bulla; distinct gap between cingula of lower canines when viewed from above; pale patch or short stripe (sometimes faint) on top of head between ears . . . . . *Tonatia saurophila*

1′. Postorbital constriction 5.6–6.1 mm; no secondary process on mastoid; posterior medial margins of cingula of lower canines nearly touching; no pale patch or stripe on top of head . . . . . *Tonatia bidens*

Tonatia bidens (Spix, 1823)
Spix's Round-eared Bat

SYNONYMS:

Vampyrus bidens Spix, 1823:65; type locality "fluvium St. Francisci" (= Rio São Francisco), Bahia, Brazil.

[*Tonatia*] *bidens*: Gray, 1827:71, footnote, in Griffith, Hamilton-Smith, and Pidgeon, 1827; first use of current name combination.

Phyllostoma childreni Gray, 1838b:488; type locality "S. America."

Phyllostoma bidens: Schinz, 1844:236; name combination.

Tylostoma bidens: P. Gervais, 1856a:49; name combination.

V[*ampyrus*]. *(Tylostoma) bidens*: W. Peters, 1856a:304; name combination.

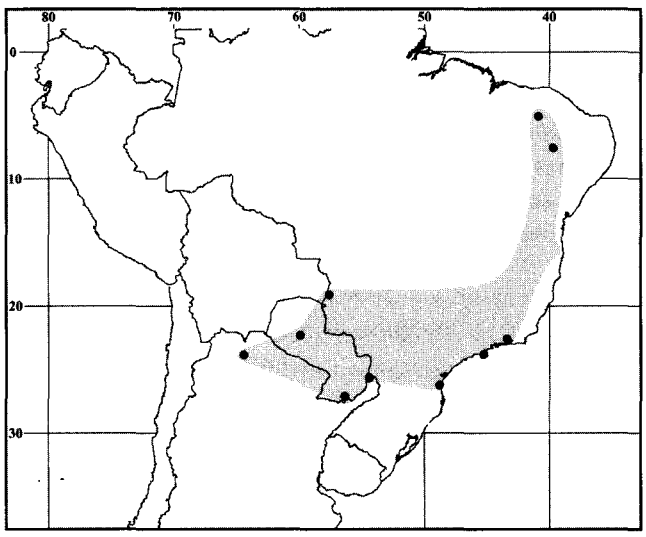
Lophostoma bidens: W. Peters, 1865c:509; name combination.

Ph[*yllostoma (Tylostoma)*]. *Childreni*: W. Peters, 1865c: 514; name combination.

Tylostoma childreni: Gray, 1866b:114; name combination.

DISTRIBUTION: *Tonatia bidens* is known from eastern Brazil, Paraguay, and northern Argentina.

MARGINAL LOCALITIES (Map 157; from S. L. Williams, Willig, and Reid 1995, except as noted): BRAZIL: Ceará, Reserva Particular do Patrimônio Natural Serra das Almas (S. S. P. Silva et al. 2004); Pernambuco, Fazenda Maniçoba, 13.7 km S of Exu (Mares et al. 1981; Willig 1983); Bahia, Pardo River Valley (Faria, Soares-Santos, and Sampaio 2006, not mapped); Rio de Janeiro, Tinguá (Peracchi and Albuquerque 1986); São Paulo, Ilha de São Sebastião (C. O. C. Vieira 1955); Santa Catarina, Joinville. ARGENTINA: Misiones, Cataratas del Iguazú (Villa-R. and Villa-Cornejo 1973, as *T. silvicola*). PARAGUAY: Itapúa, Arroyo San Rafael. ARGENTINA: Jujuy, Laguna La Brea. PARAGUAY: Boquerón, Orloff (Myers, White, and Stallings 1983). BRAZIL, Mato Grosso do Sul, Urucúm.



Map 157 Marginal localities for *Tonatia bidens* ●

SUBSPECIES: We treat *T. bidens* as monotypic.

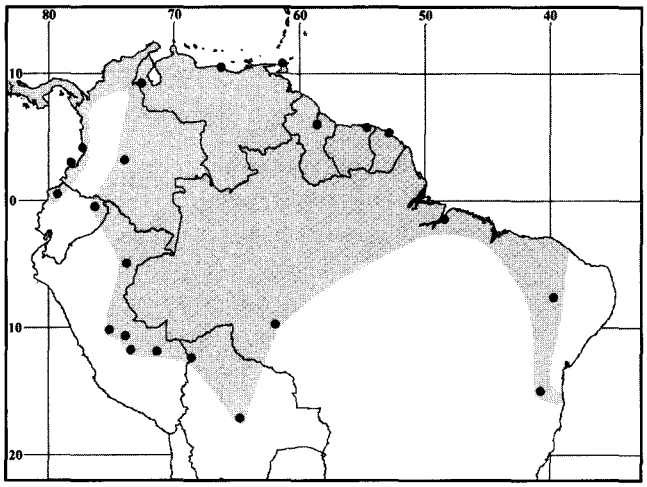
NATURAL HISTORY: *Tonatia bidens* has been reported from dry-land forest habitats (Mares et al. 1981), but judging from its distribution, occupies a variety of forest types. Willig (1983) classed *T. bidens* as a foliage gleaning insectivore. Esbérard and Bergallo (2004) recovered remains of a variety of insects, as well as the remains of four classes of vertebrates, under feeding roosts in southeastern Brazil. They found *T. bidens* using grottos, a hole in a palm tree, and caves and hollows associated with springs as day roosts; a drain pipe, buildings (both abandoned and in use), a hollow tree, a grotto, and a spring were used as feeding roosts. Esbérard and Bergallo (2004) found females pregnant in November, lactating in January and May, and postlactating in May. Webb and Loomis (1977) reported streblid batflies found on bats identified as *T. bidens*, but based on geographic distribution, many if not most of the hosts were *T. saurophila*. This likely is true for the nine species of streblids listed by R. Guerrero (1997) for *T. bidens*. However, Esbérard and Bergallo (2004) correctly identified *T. bidens* as the host of the five species of streblids they in recovered from *Tonatia* in Rio de Janeiro, Brazil.

REMARKS: Stephen L. Williams, Willig, and Reid (1995) found little secondary sexual dimorphism in ten measurements, with males averaging slightly larger than females. Specimens reported as *T. silvicola* from Jujuy (Fornes, Massoia, and Forrest 1967) and from Misiones (Villa-R. and Villa-Cornejo 1973) are *T. bidens* according to Barquez, Giannini, and Mares (1993). References to *T. bidens* from Central America and northern South America apply to *Tonatia saurophila* Koopman and Williams. Myers and Wetzel (1983) and S. L. Williams, Willig, and Reid (1995) also have provided measurements for this species. D. C. Carter and Dolan (1978) provided information on and measurements of the apparent holotype of *Vampyrus bidens* Spix and the holotype of *Phyllostoma childreni* Gray.

Tonatia saurophila Koopman and Williams, 1951
Pale-crowned Bat

SYNONYMS:

Tonatia saurophila Koopman and Williams, 1951:11; type locality "Wallingford Roadside Cave, Balaclava, St. Elizabeth Parish, Jamaica."



Map 158 Marginal localities for *Tonatia saurophila* ●

Additional synonyms under Subspecies.

DISTRIBUTION: *Tonatia saurophila* is known from Colombia, Venezuela, the Guianas, northern Brazil, and Amazonian Ecuador and Peru. The species also occurs in Central America.

MARGINAL LOCALITIES (Map 158): TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro Road (Hill 1965). SURINAM: Marowijne, Perica (Genoways and Williams 1984). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL: Pará, Guama Ecological Research Area (Handley 1967); Pernambuco, Fazenda Maniçoba (Mares et al. 1981; Willig 1983); Bahia, Região de Conquista (Falcão, Soares-Santos, and Drummond 2005); Bahia, Pardo River Valley (Faria, Soares-Santos, and Sampaio 2006, not mapped); Rondônia, Cachoeira Nazaré (MPEG 20918). BOLIVIA: Cochabamba, Sajta (S. Anderson 1997); Pando, Chivé (Sawada and Harada 1986). PERU: Madre de Dios, Cocha Cashu (Terborgh, Fitzpatrick, and Emmons 1984, as *Tonatia bidens*); Cusco, Pagorini (S. Solari et al. 1999); Ucayali, Largato (Tuttle 1970); Pasco, Iscozacín (Ascorra, Gorchov, and Cornejo 1989); Loreto, Jenaro Herrera (Ascorra, Gorchov, and Cornejo 1994). ECUADOR: Orellana, Laguna Garzacocha (Albuja 1999). COLOMBIA: Meta, Municipio de San Juan de Arama (Sánchez-Palomino and Rivas-Pava 1993); Valle del Cauca, North side of Bahía Málaga (Alberico 1994); Cauca, Gorgona Island (Cuervo-Díaz, Hernández-Camacho, and Cadena 1986). ECUADOR: Esmeraldas, Valle de Sade (Albuja 1999). VENEZUELA (Handley 1976): Zulia, El Rosario, 48 km WNW of Encontrados; Miranda, Birongo.

SUBSPECIES: Two of the three recognized subspecies of *T. saurophila* occur in South America. The nominate subspecies was described from material recovered from a cave deposit in Jamaica, where the taxon no longer exists.

T. s. bakeri S. L. Williams, Willig, and Reid, 1995

SYNONYM:

Tonatia saurophila bakeri S. L. Williams, Willig, and Reid, 1995:622; type locality "6 km SW Cana, ca, 1,200 m, Darién, Panama."

This subspecies is known from northern Colombia and from northern Venezuela north of the Cordillera de Mérida.

T. s. maresi S. L. Williams, Willig, and Reid, 1995

SYNONYMS:

Tonatia saurophila maresi S. L. Williams, Willig, and Reid, 1995:623; type locality "Blanchisseuse, Trinidad, Trinidad and Tobago."

Tonatia saurophilla Falcão, Soares-Santos, and Drummond, 2005:222; incorrect subsequent spelling of *Tonatia saurophila* Koopman and Williams, 1951.

This subspecies is known from Venezuela (east and south of the Cordillera de Mérida), northern Brazil, the Guianas, and along the eastern slope of the Andes and adjacent lowlands of Colombia, Ecuador, Peru, and Bolivia.

NATURAL HISTORY: All recent information on Central and South American populations, prior to the revision by S. L. Williams, Willig, and Reid (1995), has appeared under the name *T. bidens*. Hill (1965), D. C. Carter, Pine, and Davis (1966), Handley (1966c, 1976), Mares et al. (1981), Genoways and Williams (1984), reported *T. saurophila* (as *T. bidens*) from a variety of forest habitats. Handley (1976) also reported collecting individuals in swamps and in agricultural areas. Goodwin and Greenhall (1961, as *T. bidens*) found the species roosting in hollow trees. Goodwin and Greenhall (1961) gave fruit as the diet, to which Gardner (1977c) added insects. Although the name implies an affinity for lizards, we have no evidence that *T. saurophila* eats vertebrates.

Gardner (1976) reported (as *T. bidens*) two females from eastern Peru, taken on 3 April and a third on 23 July, that were neither pregnant nor lactating. He also caught two pregnant females on 23 July; one contained a very small embryo, the other contained a 35-mm-CR, near-term fetus. Redford and Eisenberg (1992), misinterpreting Gardner's (1976) report, stated that each pregnant female contained two embryos.

Webb and Loomis (1977) reported five streblid batflies recovered from *T. bidens*; however, most if not all of these host records probably represented *T. saurophila*. R. Guerrero (1985a) added two spinturnicid mites and one streblid batfly. *Tonatia saurophila* is the host for at least three of the streblids R. Guerrero (1997) listed for *T. bidens*.

The karyotype is $2n = 16$, FN = 20 (R. J. Baker and Hsu 1970).

REMARKS: *Tonatia saurophila* is based on subfossil material from cave deposits. The name refers to the "Lizard layers," which are the strata in Wallingford Roadside Cave where the type and paratype were found. Koopman (1976) later treated this taxon as a subspecies of *T. bidens*. *Tonatia saurophila* can be distinguished from its similar-sized congener, *T. bidens*, by the presence of a pale patch or stripe on the top of the head; a wider gap separating the cingulae of the lower canines; and by the greater development of the mastoid region, in which the mastoid overlies the posterior region of the bulla and hides the posterior foramen of the cochlea when viewed ventrally (S. L. Williams, Willig, and Reid 1995). Goodwin (1942b), Goodwin and Greenhall (1961), Hill (1965), D. C. Carter, Pine, and Davis (1966), Gardner (1976), Swanepoel and Genoways (1979), Genoways and Williams (1980, 1984), C. H. Carter et al. (1981), and S. L. Williams, Willig, and Reid (1995) have provided measurements for this species (all except the latter, reported under the name *T. bidens*). Genoways and Williams (1984) found no secondary sexual variation based on nine measurements of *T. saurophila* (coefficients of variation ranged from 0.8 to 3.4) in their sample from Surinam.

Genus *Trachops* Gray, 1847

The monotypic genus *Trachops* is represented by the medium-sized *T. cirrhosus* (forearm 58–65 mm, greatest length of skull 27–31 mm), which is easily recognized by the presence of papilla-like protuberances on the chin and lips and by the finely serrated margins of the noseleaf. The tail extends to the middle of the interfemoral membrane and the calcar is about the same length as the foot. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Vampyrus Spix, 1823:64; type species here designated as *Vampyrus cirrhosus* Spix, 1823; preoccupied by *Vampyrus* Beckmann, 1772; *Vampyrus* Ranzani, 1820; and *Vampyrus* Leach, 1821b.

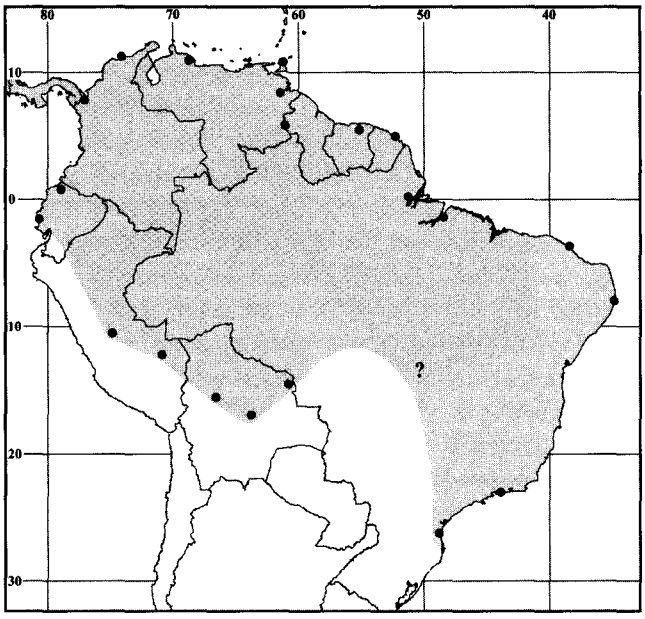
Istiophorus Gray, 1825a:242; replacement name for *Vamyprus* Spix, 1823; not *Vampyrus* Leach, 1821b; not *Vampyrus* Beckmann, 1772; preoccupied by *Istiophorus* Lacépède, 1802 (Osteichthyes).

Histiophorus Agassiz, 1847:183; unjustified emendation of *Istiophorus* Gray.

Trachops Gray, 1847:14; type species *Trachops fuliginosus* Gray, 1847, by original designation.

Trachyops W. Peters, 1865c:512; incorrect subsequent spelling of *Trachops* Gray.

Trachyops Trouessart, 1897:154; incorrect subsequent spelling of *Trachops* Gray.



Map 159 Marginal localities for *Trachops cirrhosus* •

Trachops cirrhosus (Spix, 1823)
Fringe-lipped Bat

SYNONYMS:

T[*ylostoma*]. *mexicana* Saussure, 1860:484; type locality "les régions chaudes du Mexique."

Additional synonyms under Subspecies.

DISTRIBUTION: *Trachops cirrhosus* is known from Colombia, Venezuela, Trinidad, Guyana, Surinam, French Guiana, Ecuador, Peru, Brazil, and Bolivia. Elsewhere, the species occurs in Mexico and Central America.

MARGINAL LOCALITIES (Map 159): COLOMBIA: Magdalena, Bonda (J. A. Allen 1900a). VENEZUELA: Falcón, Riecito (Handley 1976). TRINIDAD AND TOBAGO: Trinidad, Blanchisseuse (C. H. Carter et al. 1981). VENEZUELA: Delta Amacuro, Río Acoíma (Ochoa 1995). GUYANA: Cuyuni-Mazaruni, Namai Creek (Lim and Engstrom 2000). SURINAM: Para, Zanderij (Genoways, Williams, and Groen 1981). FRENCH GUIANA: Cayenne (Brosset and Dubost 1968). BRAZIL: Amapá, Rio Maruanum (Carvalho 1962a); Pará, Guama Ecological Research Area (Handley 1967); Ceará, Fortaleza (C. O. C. Vieira 1955); Pernambuco, Pernambuco (type locality of *Trachops fuliginosus* Gray); Rio de Janeiro, Mangaratiba (Peracchi, Albuquerque, and Raimundo 1982); Santa Catarina, Joinvile (type locality of *Trachops cirrhosus ehrhardti* Felten). BOLIVIA: Santa Cruz, Los Fierros (S. Anderson 1997); Santa Cruz, 25 km NW of Santa Rosa de Sara (S. Anderson 1997); Beni, Serranía Eva Eva (Hinojosa, S. Anderson 1997). PERU: Madre de Dios, Manu (Koopman 1978); Pasco, San Juan (Tuttle 1970). ECUADOR (Albuja

1999): Manabí, Estero Achiote; Esmeraldas, San Miguel. COLOMBIA: Chocó, Sautata (Sanborn 1932b).

SUBSPECIES: We recognize three subspecies of *T. cirrhosus*, two of which occur in South America.

T. c. cirrhosus (Spix, 1823)

SYNONYMS:

Vampyrus cirrhosus Spix, 1823:64; no type locality stated in Spix's description, but on page 53 (as noted by Husson 1962) Spix stated that the bats were collected in Brazil; type locality restricted to the state of Pará, Brazil, by Husson (1962:115); previous restrictions to Pernambuco, Brazil, based on the type locality of *Trachops fuliginosus* Gray are invalid.

Ph[yllostoma]. cirrhosum: J. B. Fischer, 1829:126; name combination.

Vampyris cirrhosum Gray, 1847:14; incorrect subsequent spelling of *Vampyrus cirrhosus* Spix.

Trachops fuliginosus Gray, 1847:14; type locality "Pernambuco," Brazil.

Trachyops cirrhosus: W. Peters, 1865c:512; first use of current name combination and incorrect subsequent spelling of *Trachops* Gray.

Phyllostoma (Trachops) fuliginosum: Pelzeln, 1883:32; name combination.

Trachops cirrhosa Cabrera 1958:69; incorrect subsequent spelling of *Trachops cirrhosus* Spix.

This subspecies is distributed in Colombia, Venezuela, the Guianas, eastern Peru, and northern and central Brazil.

T. c. ehrhardti Felten 1956

SYNONYM:

Trachops cirrhosus ehrhardti Felten 1956b:369; type locality "Joinvile," Santa Catarina, Brazil.

This subspecies is in southern Brazil.

NATURAL HISTORY: *Trachops cirrhosus* is commonly associated with forest and stream habitats (Handley 1966c, 1976; Tuttle 1970), but also has been reported from open savannah and agricultural areas. This species roosts in caves, hollow trees, houses, and culverts (Goodwin and Greenhall 1961; Handley 1966c, 1976; Kalko et al. 1999). Gardner (1977c) summarized evidence that *T. cirrhosus* feeds on insects and small vertebrates, including lizards and bats, and classed it as a carnivore. Subsequent authors have elaborated on the feeding habits of this species (Pine and Anderson 1980; Peracchi, Albuquerque, and Raimundo 1982), and its predation behavior on frogs is well documented (Barclay et al. 1981). Bonato and Facure (2000) found the remains of a thumbless bat (*Furipterus horrens*) in the stomach of an adult male collected in the Northeast of Brazil. Ubelaker, Specian, and Duszynski (1977) and Cuartas and Muñoz (1999) reported trichostrongylid nematodes found in the small intestine of *T. cirrhosus*. Brennan and Reed (1975) identified four species of trombiculid mites recovered from Venezuelan specimens. Webb and Loomis (1977) listed a labidocarpid mite, two spinturnicid mites, one trombiculid mite, two argasid ticks, and eight streblid batflies as known ectoparasites on *T. cirrhosus*. R. Guerrero (1985a) listed an additional species of spinturnicid mite, another macronyssid mite, a flea, and six species of batflies. R. Guerrero (1997) listed 15 species of streblid batflies confirmed from *T. cirrhosus*, 5 of which had not been listed by Webb and Loomis (1977) and R. Guerrero (1985a), suggesting that some of the earlier batfly identifications had been erroneous. Kalko et al. (1999) described roosting and foraging behavior during the dry season on Barro Colorado Island, Panama. Cramer, Willig, and Jones (2001) have a detailed description, along with measurements and a summary of natural history information, in their *Mammalian Species* account. The karyotype is $2n = 30$, FN = 56 (R. J. Baker et al. 1982).

REMARKS: Felten (1956b) described specimens of *T. c. ehrhardti* as being smaller than specimens of *T. c. cirrhosus* from northern South America in some cranial measurements. Husson (1962) wrote that, while external measurements of a specimen from Surinam were much larger than those of the sample from Colombia reported on by Hershkovitz (1949c), the cranial measurements corresponded well. W. B. Davis and Carter (1962a), comparing published measurements of Central American specimens with those of Hershkovitz's (1949c) sample, reported considerable overlap in the ranges of variation. Goodwin (1946), Goodwin and Greenhall (1961), W. B. Davis and Carter (1962a), Husson (1962, 1978), and Swanepoel and Genoways (1979) have provided measurements of South American specimens.

The statement by Cramer, Willig, and Jones (2001), "Type *Vampyrus cirrhosus* Spix or possible *V. soricinus* Spix," does not constitute fixation of the type species of *Istiophorus* Gray, 1825. We herein select *Vampyrus cirrhosus* Spix 1923, one of the two species Spix included under the generic name *Vampyrus*, as the type species of *Vampyrus* Spix, 1823. *Istiophorus* Gray, 1825, is a replacement name for *Vampyrus* Spix, which is preoccupied by *Vampyrus* Beckmann, 1772; *Vampyrus* Ranzani, 1820; and *Vampyrus* Leach, 1821b. The type species of a genus-level replacement name is the same as the type species of the name replaced; therefore, *Vampyrus cirrhosus* Spix also is the type species of *Istiophorus* Gray.

Czaplewski, Rincón, and Morgan (2005) reported late Pleistocene fossils recovered from a tar seep in the state of Zulia, Venezuela. D. C. Carter and Dolan (1978) gave information on and measurements of the holotype of *Trachops cirrhosus ehrhardti* Felten.

Genus *Trinycteris* Sanborn, 1949

This monotypic genus is represented by *Trinycteris nicefori*, a small bat (forearm 37.1–40.2 mm, $n = 24$; greatest length of skull 20.7–22.0 mm, $n = 24$) distinguished by four-banded dorsal pelage (the pale basal band is narrow and inconspicuous) and the pale median dorsal stripe usually evident on the lower back. The narrow, pale basal band on the dorsal fur is followed by a dark band, a broad pale band, and then the dark terminal band of the hair tips. The ears are pointed and have broadly concave outer margins. Other identifying features include the lack of a band of skin across the top of the head connecting the ears; the throat has numerous long, dark, stiff hairs interspersed in the pelage; the lower margin of narial horseshoe merges smoothly with the upper lip; and the chin and lower lip bear a pair of smooth tubercles, which are partly divided by a median groove. The metacarpal of digit IV is shorter than the metacarpal of digit V, which is shorter than the third; the calcar is shorter than foot; the rostrum is not inflated; the basisphenoid pits are deep; and the lower incisors are trifid. The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Trinycteris Sanborn, 1949:226; type species *Micronycteris (Trinycteris) nicefori* Sanborn, 1949, by monotypy; described as a subgenus of *Micronycteris* Gray.

Trinycteris: Simmons and Voss, 1998:92; first use as a full genus.

Trinycteris nicefori Sanborn, 1949

Niceforo's Bat

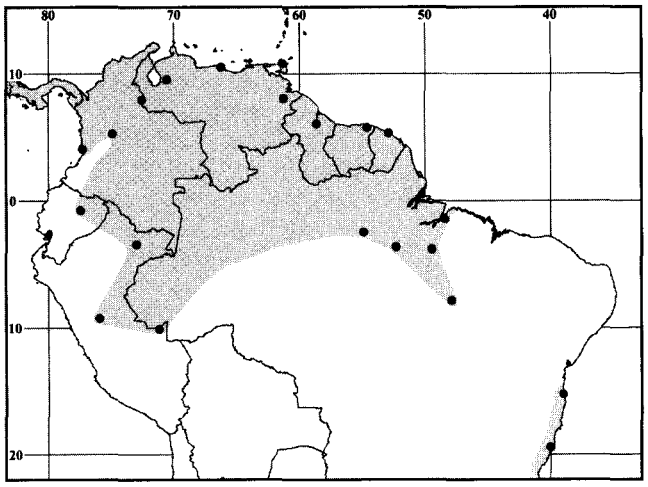
SYNONYMS:

Micronycteris (Trinycteris) nicefori Sanborn, 1949a:230; type locality "Cúcuta," Norte de Santander, Colombia.

[*Trinycteris*] *nicefori*: Simmons and Voss, 1998:62; first use of current name combination.

DISTRIBUTION: *Trinycteris nicefori* occurs on the island of Trinidad and east of the Andes in Colombia, Venezuela, Guyana, Surinam, and Peru, with a disjunct population in the state of Espírito Santo, Brazil. Elsewhere, *T. nicefori* occurs in southern Mexico and Central America.

MARGINAL LOCALITIES (Map 160): TRINIDAD AND TOBAGO: Trinidad, Las Cuevas (C. H. Carter et al. 1981). VENEZUELA: Bolívar, Unidad V, Reserva Forestal Imataca (Ochoa 1995). GUYANA: Cuyuni-Mazaruni, 24 miles from Bartica on Potaro road (Hill 1965). SURINAM: Marowijne, 10 km N and 24 km W of Moengo (Genoways and Williams 1979b). FRENCH GUIANA: Paracou (Simmons and Voss 1998). BRAZIL: Pará, Utinga (Handley 1967); Pará, Area do Caraipe (Pine et al. 1996); Tocantins, Município Palmeirante (Nunes et al. 2005); Pará, 52 km SSW of Altamira (Voss and Emmons 1996); Pará, Alter do Chão (Bernard 2001b). PERU: Ucayali, Balta (Voss and Emmons 1996); Huánuco, vicinity of Tingo María (Bowles, Cope, and Cope 1979); Loreto, Puerto Indiana (Pirlot 1968). ECUADOR: Orellana, Santa Rosa de Arapino (Albuja 1999). COLOMBIA: Tolima, Mariquita (Muñoz 2001); Valle del Cauca, Bahía Málaga Naval Base (Alberico 1994); Norte de Santander, Cúcuta (type locality of *Micronycteris (Trinycteris) nicefori* Sanborn). VENEZUELA (Handley 1976): Trujillo 19 km N of Valera; Miranda, Birongo. *Disjunct distribution in southeastern Brazil*: Bahia, Una (Faria, Soares-Santos, and Sampaio 2006); Espírito Santo, Município de Linhares (Peracchi and Albuquerque 1985).



Map 160 Marginal localities for *Trinycteris nicefori* •

SUBSPECIES: We treat *T. nicefori* as monotypic.

NATURAL HISTORY: *Trinycteris nicefori* is known from a variety of habitats ranging from forest to agricultural areas (Hill 1965; Handley 1966c, 1976; S. L. Williams and Genoways 1980a). Pine et al. (1996) caught this species in ground-level nets in tall terra-firme forest in southeastern Pará State in Brazil. The species roosts in hollow trees, tunnels, and buildings (Goodwin and Greenhall 1961; Handley 1966c). Sanborn (1949) wrote that the type specimen was caught in a rock tunnel along with *Lonchorhina aurita* and *Micronycteris minuta*. Goodwin and Greenhall (1961) suggested that *T. nicefori* feeds on fruit and insects. Brennan and Reed (1975) identified a species of trombiculid mite found on Venezuelan specimens. Webb and Loomis (1977) listed four species of streblid batflies as known ectoparasites, to which R. Guerrero (1985a) added a species of spinturnicid mite and two streblid batflies. R. Guerrero (1997) increased the number of streblid species known from *T. nicefori* to seven. The karyotype is $2n = 28$, FN = 52 (Honeycutt, Baker, and Genoways 1980; R. J. Baker, Genoways, and Seyfarth 1981; R. J. Baker et al. 1982).

REMARKS: Starrett (1976) claimed that *T. nicefori* from Costa Rica agreed in all essential characters and in most measurements with the specimens described by Sanborn

(1949a) from Colombia, but lacked the faint gray stripe on the lower back reported for Colombian specimens. Thirteen (18%) of 74 skins from Costa Rica, Panama, Venezuela, Guyana, and Brazil, in the USNM lack a clear indication of the dorsal stripe, demonstrating that the stripe is a variable character. Sanborn (1949a), Goodwin and Greenhall (1961), Hill (1965), Genoways and Williams (1979b), Swanepoel and Genoways (1979), and S. L. Williams and Genoways (1980a) have provided measurements of South American specimens.

Genus *Vampyrum* Rafinesque, 1815

The monotypic genus *Vampyrum* is represented by *V. spectrum*, the largest bat in the Western Hemisphere (forearm 101–110 mm, greatest length of skull 49–54 mm). In addition to its size, *Vampyrum* (along with *Chrotopterus*) is unusual among the phyllostomines in lacking a visible tail. The calcar is longer than the foot. *Vampyrum* and *Chrotopterus* also share an unusual occlusion pattern in which the first upper incisor contacts the broad cingular shelf of the posterolingual base of the lower canine when the mouth is closed (Wetterer, Rockman, and Simmons 2000:77). The dental formula is 2/2, 1/1, 2/3, 3/3 × 2 = 34.

SYNONYMS:

Vampyrum Rafinesque, 1815:54, type species *Phyllostoma spectrum* É. Geoffroy St.-Hilaire, 1810b (= *Vespertilio spectrum* Linnaeus, 1758), by subsequent selection (Andersen 1908a:433).

Vampyrus Ranzani, 1820:190; type species *Vampyrus spectrum*: Ranzani, 1820 (= *Vespertilio spectrum* Linnaeus, 1758), by monotypy; preoccupied by *Vampyrus* Beckmann, 1772.

Vampyrus Leach, 1821b:74; type species *Vampyrus spectrum*: Leach, 1821b:80 (= *Vespertilio spectrum* Linnaeus, 1758), by monotypy; primary objective homonym of *Vampyrus spectrum*: Ranzani, 1820; preoccupied by *Vampyrus* Beckmann, 1772.

Vampirus Lesson, 1827:78; incorrect subsequent spelling of *Vampyrus* of authors.

Vampyris Gray, 1847:14; incorrect subsequent spelling of *Vampyrus* of authors.

Vampyrun Ospina-Ante and Gómez, 2000; incorrect subsequent spelling of *Vampyrum* Rafinesque.

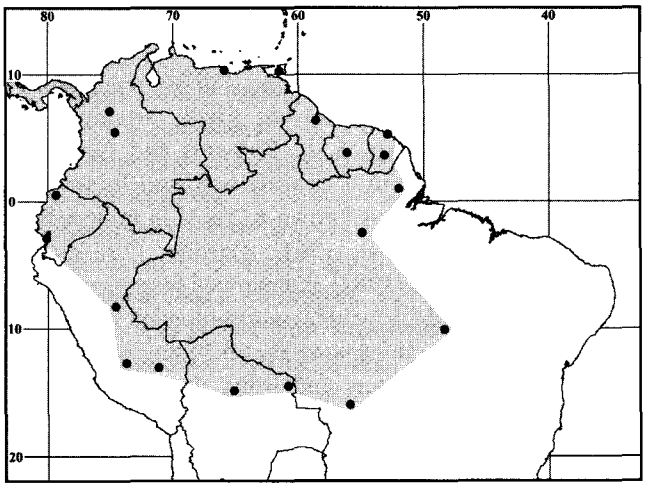
Vampirum Montenegro and Romero-Ruiz, 2000:645; incorrect subsequent spelling of *Vampyrum* Rafinesque.

Vampyrum spectrum (Linnaeus, 1758)

Great Spectral Bat

SYNONYMS:

[*Vespertilio*] *spectrum* Linnaeus, 1758:31; type locality "America *australi*," restricted to Surinam by O. Thomas (1911b:130).



Map 161 Marginal localities for *Vampyrum spectrum* •

Phyllostomus spectrum: Daudin in Lacépède, 1802:189; name combination.

Phyllostoma spectrum: É. Geoffroy St.-Hilaire, 1810b:174; name combination.

Vampyrus spectrum: Ranzani, 1820:190; name combination.

[*Vampyrus (Vampyrus)*] *spectrum*: Trouessart, 1897:153; name combination.

Vampyrus spectrum nelsoni Goldman, 1917:115; type locality "Coatzacoalcos, Vera Cruz, Mexico.

Vampyrum spectrum: Goodwin 1942c:128; first use of current name combination.

DISTRIBUTION: *Vampyrum spectrum* occurs in Colombia, Venezuela, Trinidad, Surinam, French Guiana, Ecuador, Brazil, Peru, and Bolivia. Elsewhere, it is known from Mexico and Central America.

MARGINAL LOCALITIES (Map 161): TRINIDAD AND TOBAGO: Trinidad, Santa María (C. H. Carter et al. 1981). GUYANA: Cuyuni-Mazaruni, Kartabo (H. E. Anthony 1921b). SURINAM: Brokopondo, Rudi Kappelliegveld (S. L. Williams and Genoways 1980a). FRENCH GUIANA: Paracou (Simmons and Voss 1998); Les Eaux Claires (Simmons, Voss, and Peckham 2000). BRAZIL: Amapá, Serra do Navio (Peracchi, Raimundo, and Tunnare 1984); Pará, Alter do Chão (Bernard 2001b); Tocantins, Município Paraíso do Tocantins (Nunes et al. 2005); Mato Grosso, Barra do Arica (C. O. C. Vieira 1955). BOLIVIA: Santa Cruz, Los Fierros (Emmons 1998); Beni, Río Tajacuchi (S. Anderson 1991). PERU: Cusco, Cosñipata (Sanborn 1949b); Ayacucho, San José (LSUMZ 16458); Ucayali, Yarinacocha (Sanborn 1949b). ECUADOR: Guayas, San Ramón (AMNH 66815); Pichincha, Patricia Pilar (Albuja and Mena 2004). COLOMBIA (Muñoz 2001): Caldas, La Dorada; Antioquia, Anorí. VENEZUELA: Miranda, 7 km E of Río Chico (Handley 1976).

SUBSPECIES: We are treating *V. spectrum* as monotypic.

NATURAL HISTORY: Handley (1976) reported five specimens of *V. spectrum* from yards, swamps, and evergreen-forest habitats. S. L. Williams and Genoways (1980a) collected one in a clearing bordered by lowland rainforest. This species is known to roost in hollow trees (Goodwin and Greenhall 1961). Gardner (1977c) and Navarro and Wilson (1982) summarized references documenting the diet, which includes warm-blooded vertebrates such as small birds and mammals (including other bats), and possibly some insects and fruits. In their summary of endoparasites found in leaf-nosed bats, Ubelaker, Specian, and Duszynski (1977) mentioned only trypanosomes as infecting *V. spectrum*. Webb and Loomis (1977) listed one streblid batfly and two trombiculid mites as known ectoparasites. R. Guerrero (1985a) listed an additional species of spinturnicid mite, and later (1997) added another species of streblid batfly. Navarro and Wilson (1982) presented measurements, illustrations, and a synopsis of natural history information in their *Mammalian Species* account. The karyotype is $2n = 30$, FN = 56 (R. J. Baker et al. 1982).

REMARKS: As Hall (1981:118) pointed out, the names *Vespertilio nasutus* G. Shaw, 1800, *V. guianensis* Daudin in Lacépède, 1802:188, and *V. maximus* É. Geoffroy St.-Hilaire, 1806 were listed as synonyms of *V. spectrum* by Sanborn (1949b), Cabrera (1958), and Hall and Kelson (1959). These names are based on Buffon's *La Grande Serotine de la Guyanne*, which may be a composite of several species of large bat; but, because it is illustrated as having an obvious and well-developed tail, is not a *Vampyrum*.

Two subspecies of *V. spectrum* have been recognized: the nominate subspecies in South America and *V. s. nelsoni* in Mexico and Central America. However, Husson (1962), Handley (1966c), and R. L. W. Peterson and Kirmse (1969) have provided evidence supporting their conclusions that the species is monotypic, a determination we follow here. The locality "Boquiron, Colombia" for the skull illustrated in Hall and Kelson (1959) was corrected to Boqueron, Panama by Hall (1981).